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BY

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To

PROFESSOR WILLIAM H. VAN BUREN,

IN GRATEFUL ACKNOWLEDGMENT OF

MUCH VALUABLE COUNSEL

AND

IN REMEMBRANCE OF MANY YEARS OF PROFESSIONAL ASSOCIATION,

THIS BOOK

Is Respectfully Inscribed

BY THE AUTHOR

PREFACE.

THIS volume is designed by the publishers to be one of a series addressed to the general medical practitioner. My aim has, therefore, been to present the various venereal diseases as clearly as possible, avoiding such unnecessary refinement upon theoretical and mooted points as would be apt to lead to confusion or to error.

Practical utility, as well as what I believe to be sound doctrine, has been kept constantly in view, and no effort has been made to display a long list of remedies. Such means as I have found most valuable are recorded, together with suggestions from well-recognized authorities. A physician cannot afford to have many remedies for a given disease if he expects to use any of them well.

My views on many of the subjects included in this volume are already before the public, scattered through various books and essays. In the main these views are unchanged. Such alterations as time and a larger experience have effected are recorded herein. My ideas on the treatment of syphilis are only modified in that the tonic dose of the specific is made rather smaller, and the course rather longer than formerly.

I have opposed the views of those gentlemen who are throwing confusion in the way of the general practitioner by trying to break down the distinctions between the initial lesion of true syphilis, and chancroid; and who teach that chancroid may be derived from the products of the syphilitic early or late lesions. I have also taken issue with the experimenters who claim to prevent syphilis by excising the initial lesion, on the ground that something more than induration in a sore is necessary in order to prove it to be a syphilitic chancre. Without a reliable history showing previous freedom from syphilis in such patients, added to confrontation, the records of excised chancres fail to be convincing, and the moderate percentage of claimed success is, thus far, not proven. It is to be hoped that some good will eventually come of these experiments, but more accuracy of observation must be brought to the investigation than has been yet employed.

Finally, I have raised my voice, for what it may be worth, in protest

against the views of the new school in urethral pathology, which seems to claim that every natural undulation in the tissues of the pendulous urethra is a stricture fit for cutting, and that all the ills of the genito-urinary passages may be accounted for by the existence of these undulations, and, usually, made to disappear when the latter are cut.

To the honest labor and mechanical genius of the leader of this school I tender my respect. The profession is indebted to him for some capital instruments and for a broader understanding of the tolerance and of the possible capacity of the urethra than it has yet possessed.

The profession as a whole doubtless still underrates the normal capacity of the male urethra, and after the present rage for cutting has passed and the reaction has come, a calm equilibrium will finally establish itself, which, on the whole, will be to the advantage of those patients who in time to come may suffer with urethral difficulties.

The theories of the new school are as ingeniously perfect as the instruments which carry them out; but, unfortunately, its claims seem to leave out of view that the disease for which the patient seeks relief is only a symptom, and that such symptom may be due to a variety of causes. What will cure the symptom in one case will not necesarily do so in another. And a serious criticism upon the methods of the new school is that it does not generally, in its lists of published cases, give any prominence to those cases which have been cut without relief of the symptoms complained of.

In short, the pathology and the treatment of the new school are narrow, and tend to encourage routine practice in the young, to the detriment of a careful study of each case.

Thanks are due to Dr. G. H. Fox, of New York, for the admirable photographs from nature after which many of the woodcuts illustrating venereal lesions have been made. Syphilitic lesions cannot be perfectly represented without the use of color, but I think that the exhibition of the topography of the different eruptions is in itself enough to justify the use of woodcuts.

E. L. KEYES.

NEW YORK, Jan. 1, 1880.

No. 1 Park Avenue,
Corner of Thirty-fourth Street East.

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THE VENEREAL DISEASES.

PART I.

CHAPTER I.

CHANCROID.

THE NON-SYPHILITIC VENEREAL ULCER.

Chancroid.—Definition.—General Description of Typical Clinical Chancroid.—The Nature of the Chancroidal Poison.—Answers to the Objections made to the Existence of any Special Chancroidal Virus, and Discussion of the Alleged Cases of Chancroid purporting to have been produced by the Inoculation of Pus not derived from a Chancroid.—Is the Poison of Chancroid a Modified Syphilitic Virus?—Unity and Duality in Syphilis.—Twelve Propositions setting forth Facts relative to the Question of Duality, and believed to be sustained by Facts, Experimental and Clinical, now before the Profession.

Definition.—Chancroid is a virulent ulcer. It is local and never the starting-point of syphilis. It is always due to contact of the surface involved with pus derived from a similar ulcer, and its own secretions are freely auto-inoculable.

These characters are cardinal and uniform. Clinically, a chancroid does not exist which does not fulfil each of these conditions. A number of objective features, which will be detailed later, stamp chancroid with an especial clinical individuality in typical cases, but each of these latter special features is subject to variation: the incubation; the softness of the base; the appearance of the edges and of the surface; the quality of the secretion, and the subjective symptoms also, in a given case, all may differ from those found in the typical chancroid, without disconcerting the clinical observer. If, however, a chancroid could be due to anything excepting the inoculation of chancroidal pus—if its own pus could fail to take, when inoculated for the first time, upon the clinical bearer of the sore—if chancroid derived from a chancroid could once be shown to be the starting-point of true syphilis—then the labors of Bassereau, Clerc, Fournier, and a host of others have been in vain, and the profession is plunged again into that obscurity regarding venereal disease which obtained in the days of Hunter, and only yielded in the present century to the campaign inaugurated against it by Ricord.

The question of one or two poisons in syphilis will be discussed later. Non-syphilitic chancroid first claims a detailed description.

GENERAL DESCRIPTION OF A TYPICAL CHANCROID AS IT IS CUSTOMARY TO ENCOUNTER IT CLINICALLY.

A typical chancroid, unirritated and uncomplicated, is a rounded ulcer. In a furrow it is oval, large or small, single or multiple, simple or composed of several ulcers which have run together; its general physical characters are as constant as are those of any classical cutaneous lesion—as constant, for instance, as are the physical characters of vaccinia. A faint pink areola surrounds a chancroid. Its edges are abrupt, sharply cut at right angles to the surface (not sloping away), very often slightly undermined, because the superficial integument resists the advance of the spreading ulcer a little longer than the less dense underlying structures. The bottom of the ulcer is either pallid, with pink granulations, bathed in thick pus, or, more often, pultaceous, yellow, looking like dirty cream; and this surface, composed of sloughy structures, permeated with pus, is adherent, and blood flows on any attempt at its removal. The structures all around and those underlying this ulcer are perfectly normal, soft, and flexible. The base of the ulcer can be easily lifted up from the tissues beneath, and when rolled between the thumb and finger presents no rigidity.

Such an ulcer does not cause pain. Its bearer may be unconscious of its existence, excepting that he sees it. The pus is creamy and freely secreted from the ulcerated surface, and contains the broken-down detritus of the anatomical elements which have been involved in the progressive march of the destructive ulcer.

Such is the simple clinical chancroid as seen in a typical case. Many complications, however, may attend it and subject its appearance to corresponding variation. The more it differs from the type, the less possible is it for the surgeon to be positive in his diagnosis of its character. Nothing is more capable of correct diagnosis by mere inspection than typical chancroid; complicated chancroid may confound the astuteness of the closest differential diagnostician.

It is therefore of the first importance, in commencing the study of venereal disease, to comprehend what a chancroid is and to what variations it is liable, especially in these modern days when every ulcer produced by inoculation finds some sturdy advocate ready to proclaim it a chancroid.

An attempt to trace the history of chancroid has given occasion for the display of much erudition. No author has been more painstaking in this direction than Bassereau,[1] who brings out evidence from the writings of ancient Greek, Latin and Arabian surgeons, which establishes the presumption that contagious venereal ulcers have existed from all time; and that some at least of these ulcers were chancroidal, it is hardly reasonable to doubt. Such discussions, however, have no place in a text-book dealing only with the practical aspect of the question.

The nature of the poison of chancroid is unknown. Different observers (Donné, Didier, Salisbury) have described varying parasites as

[1] Traité des affections de la peau symptomatiques de la syphilis. Paris, 1852, p. 217 et seq.

the essential cause of chancroid; but no convincing demonstration has been given to the profession of the truth of any theory, and the world is to-day as ignorant of the nature of the essential poison of chancroid as it is of the nature of the poison of syphilis or of scarlet fever. There is a growing tendency in the profession, particularly noticeable of late years, to disclaim the existence of any poisonous quality in chancroidal pus. Such well-known authors as Hutchinson of London, Bäumler of Freiburg, and Bumstead of New York, have held this view. The latter, in a very able article read in Philadelphia, 1876, before the International Medical Congress, claims that the inoculation of the products of simple inflammation may produce a chancroid upon persons who are syphilitic or much debilitated.

But why an ulcer, let it resemble a chancroid perfectly—why such an ulcer produced upon a person in a pyogenic condition by the inoculation of indifferent inflammatory pus, should be called a chancroid, even although the pus be repeatedly auto-inoculable in generations, it is difficult to understand. Surely a pustule of acne is not a chancroid. If it were a chancroid it would spread peripherally and behave like that classic ulcer. The auto-inoculability in generations, of pus derived from a pustule of acne, confirms the well-known conclusions of Von Roosbroeck, that all pus is more or less irritating, more or less contagious. Many individuals in poor health notoriously "fester" when they are scratched, without requiring the inoculation of any substance to produce a suppurating sore. The violence done to the skin shows up the quality of the latter, and it is the pus-forming tendency which develops the ulcer upon a patient whose integument may be subjected to violence of a mechanical or of a chemical sort, and not necessarily any poison introduced from without.

If chancroid could be produced de novo by the inoculation of ordinary pus upon syphilitic and cachectic persons, the number of chancroids clinically observed upon respectable people, syphilitic and cachectic, would be vastly greater than it is. Balanitis (from tight prepuce), suppurating herpes progenitalis, gonorrhœa, and suppurative leucorrhœa in the female, are very common in such patients, but chancroid is exceedingly rare among respectable people, and does not occur (so far as the writer knows) clinically, excepting under circumstances which allow an opportunity for contagion, direct or indirect, with the secretion of a similar ulcer.

The experiments of Pick, Koebner, Kaposi, Kraus, Reder, Lee, Bidenkap, Morgan, Wigglesworth, Von Roosbroeck and others, demonstrate that all sorts of irritating secretions may produce ulcers and auto-inoculable ulcers; but no one has shown that the minute prick of a pin dipped in such pus will produce an ulcer yielding a chancroidal bubo—the virulent, not the simple suppurating bubo. No one has produced a typical chancroidal ulcer by inoculating from a half-glass of water in which one drop of simple inflammatory pus had been placed—as did Puche with a drop of chancroidal pus. And Boeck, the sturdy advocate of syphilization, would certainly not have gone to the trouble of collecting chancroidal pus in the hospitals of Christiania to send into the surrounding country for the purpose of syphilization, if ordinary pus would have done as well. Boeck himself stated that chancroidal pus would yield positive results to inoculation even when diluted with eleven hundred parts of ordinary pus.

Some years since, at the Charity Hospital, I endeavored to produce cutaneous ulcers by inoculation of indifferent patients with indifferent pus, but the experiments were not long continued, for, although some

pustules were obtained, nothing resembling the rapidly spreading destructive chancroid appeared.

Tarnowsky, an excellent and competent observer, declares[1] as deductions from a number of experiments, that the sores produced upon syphilitic persons by Bidenkap, Reder, and Koebner, are distinguishable by their form, course, absence of bubo, and results, from true chancroid, and are only the characteristic effects of the irritation of the skin in syphilitics. He believes that any irritant, if strong enough, will produce like results. He states that inoculation from these sores upon healthy subjects may produce syphilis, but not chancroid.

Zarewicz[2] of Krakau inoculated syphilitic products upon syphilitics. Pus was taken from the lesions so produced (without admixture of blood) and inoculated upon healthy persons, always with negative results, while the same pus yielded positive results when inoculated upon syphilitic persons. This proves that the lesion was not a chancroid and was not syphilis, but simply that irritating pus could be positively inoculated upon syphilitic persons, while the same inoculations were negative upon healthy persons.

On the other hand, a claim has been made by Bidenkap and Gjör (quoted by Bumstead), that five patients, not themselves syphilitic, inoculated themselves from sores produced by inoculation of the products of an irritated syphilitic chancre upon syphilitic patients, and that while the inoculated ulcers took (like chancroids) upon these healthy persons, only one of them became syphilitic, and in that case syphilis was doubtful.

Only one of these cases is important, and that one at first sight seems convincing. It is described by Bidenkap, and originally appeared in the Wiener Med. Wchnschrft. of 1865 (No. 34).

A young woman, free from syphilis (in the hospital on account of urethral and vaginal suppuration), inoculated herself with a needle through curiosity, from ulcers which Bidenkap had produced upon a syphilic patient by first taking pus from an irritated syphilitic chancre and reinoculating it through many generations. An ulcer lasting two months and producing another by spontaneous inoculation was the result upon the young woman—but no syphilis. Eighteen months later she acquired syphilis in the usual way.

The facts in this case may be explained as follows: whatever syphilitic poison taken from the chancre was inoculated upon the syphilitic patient from whom the young woman got her pus, died out, since syphilitic virus does not propagate itself by auto-inoculation. Acrid pus, auto-inoculable in generations, only was left behind, and this the young woman used, not getting any blood, and therefore avoiding contamination of the pus she used with any of the true poison of syphilis. Had the true poison of syphilis been inoculated she must have had chancre, which she did not have; not having chancre, did she have chancroid? There is nothing in the case to show that the syphilis of the patient furnishing the pus was active at the time the pus was taken by the young woman, and there is nothing to show that other irritating pus, such as that found in simple ecthyma, or in scabies, might not have also taken upon the young woman, if properly inoculated, and have produced an indolent ulcer, itself auto-

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[1] Vrtljahresschrift. f. Derm. u. Syph. I. and II. 1877.

[2] From a review by Ettinger: Jahresbericht ueber die Liestungen und Fortschritte in der Gesmtn. Med. II., ii., 1878, p. 529.

inoculable. She had a suppurating urethritis and vaginitis, and her position in the pyogenic scale was probably high.

There is no law which compels all the pathological secretions upon a person who is syphilitic to carry with them any portion of the true syphilitic virus by necessity.

On the contrary, if not admixed with blood, such secretions are not poisonous—in a syphilitic way. It is notorious that a chancroid upon a syphilitic patient may *clinically even* reproduce either chancroid alone or mixed chancre followed by syphilis. In the latter case doubtless some blood gets inoculated with the chancroidal pus. This case, therefore, demonstrates nothing.

Conflicting evidence of this sort demands great consideration and care before deductions can be drawn from it. Extensive experimentations from syphilitics to non-syphilitics is not justifiable, and voluntary experiments made by patients who declare themselves free from syphilis must be received with great caution.

Clinically, however, there is certainly no question that chancroid is derived (for practical purposes) always from contact of the part involved with the secretions of a chancroid. Inflammatory products are not known clinically to produce chancroids upon healthy people, and it is begging the question to claim that they do so, simply because an ulcer may be produced upon a syphilitic or upon an unhealthy person by inoculating him with indifferent pus.

It is well known that the pus of impetigo is not contagious clinically upon being ordinarily handled; yet who is unfamiliar with the fact that an impetiginous child (or adult) is apt to have a prompt outcrop of pustules upon any part overlying another part which is secreting pus, and to get pustules readily upon spots where such pus has been deposited by the nails? Yet certainly these facts do not militate against the non-contagious clinical quality (for others) of the pus of impetigo.

The inoculable quality of true chancroidal pus is a free, frank, virulent, rapid inoculability.—Such pus takes at once, upon the person bearing the sore, in an unmistakable manner. The healthiest bystander may be made the subject of successful experiment—an experiment always successful—unless the capacity of the skin to produce pus has been overcome by prolonged inoculations, as in syphilization. The incautious surgeon with a fissure on his finger learns the virulent inoculability of chancroidal pus to his sorrow, and he afterward handles a suspected case with the utmost circumspection, while he thrusts the same cracked finger into the cavity of an abscess full of pus without taking the least precaution or experiencing any evil result. For the successful hetero- or auto-inoculation of the clinical chancroid, no syphilis of the subject inoculated is necessary to secure a take, and no cachexia.

Is there then no difference between the pus of chancroid and that of ordinary ulcerative inflammation? Assuredly there is. And what is this difference? Certainly we do not know what it is, but we know that it is a virulent quality, and we call it a virus, a poison, not distinguishable in the pus by any microscopical or chemical quality yet described, not due to any parasite yet discovered, but none the less a virus than the virus of the rattlesnake—a virus also imponderable and intangible by any of the tests known to science. By its fruits it is known, by its effects its qualities are disclosed.

Is the poison of chancroid a modified syphilitic poison?—There is not one fact to prove it. It behaves differently in all respects.

A true chancroid certainly cannot produce syphilis, and if syphilis can produce something resembling chancroid, even yet identity is not established unless the compliment can be returned, and this has never been proved to be the case. Lindmann's 2,700 inoculations upon himself did not exhaust his power of still producing successful chancroids upon his own person. This does not resemble anything known of syphilis. Long before reaching this number, believing himself protected by his inoculations (on account of the doctrines of syphilization), he inoculated himself once with matter taken from the tonsils of a friend who had syphilis. This inoculation also took, and after forty-five days a syphilitic eruption appeared. The doctor then resumed his chancroidal inoculations, but with less faith than before in the protective value of syphilization.

Warnery of Lausanne, and Danielssen's case, are also classical examples of the lack of similarity between chancroid and syphilis. The former, after frequently inoculating himself with chancroid and getting only local ulcers, finally used the secretion from a syphilitic chancre once, and general syphilis ensued. Danielssen produced chancroids upon a patient two hundred and eighty-seven times, until the pus-forming capacity of the skin had been temporarily exhausted and chancroidal pus failed any longer to yield positive results. Then the discharge from a syphilitic chancre was used, and syphilis resulted. Meantime the suppurative capacity of the skin had returned on account of the rest allowed to it, and a new inoculation of chancroids was instituted. These took, and the patient, whose original disease was Norwegian leprosy, was again "syphilized"—to his own satisfaction, doubtless, certainly to that of Danielssen. The case originally was reported in the Deutsche Klinik for 1858, p. 322. It has since been quoted everywhere, and has done much to shake the faith of the advocates of syphilization in the value of that proceeding as a prophylactic.

These few cases place it beyond question that the poison of true syphilis is not contained in chancroidal pus. None of the cases would have existed excepting for the pleasing fiction of Auzias Turenne, which he termed syphilization, and which at one time had many adherents in the profession in different parts of Europe. Syphilization—the repeated inoculation of chancroidal pus upon an individual until the skin failed any longer to respond to the irritation, and chancroids could no longer be produced upon inoculating chancroidal pus—this syphilization was proposed as a means to be generally adopted for the purpose of furnishing immunity to the poison of true syphilis. How little immunity was furnished is shown by the cases described above.

Two points then seem to be clear: (1) chancroid pus is more freely inoculable than pus derived from any other source; it will take in a characteristic manner upon a healthy person as well as upon one who is syphilitic or cachectic; and (2) the poison of true syphilis is not contained in chancroidal pus.

If now these two points have been demonstrated, what is it that constitutes the virulence of chancroid and makes its pus more irritating than pus derived from other sources? There is but one reasonable reply to this question, namely: there is a poison, a virus in chancroidal pus, peculiar to itself, not capable of being generated de novo, not syphilitic in nature, but sui generis, an entity in itself. We do not know what this poison is, but by its effects its existence may be claimed. The advocates of the simple inflammatory nature of the ulcer have failed to furnish convincing demonstration of their claims even scientifically, while clinically

no confrontation and no single sporadic case has been reported (so far as the writer knows) showing that a typical clinical chancroid has originated de novo.

The poison of chancroid not being the poison of true syphilis, is it a modification of that poison?

This position is very stoutly maintained by a respectable minority in the profession, the notion being that the syphilitic poison, when nearly exhausted in virulence, may produce a chancroid, or that secretions of ordinary ulcers upon syphilitic subjects become capable of auto-inoculation, and that the hetero-inoculation of such secretions produces chancroids. This reduces chancroid to the condition of a bastard; but even if this state of affairs could be absolutely proved, it would be unwise clinically to admit of any relationship between chancroid and syphilis. A theoretical relationship, while seemingly facilitating diagnosis and leading to that grateful sense of accurate knowledge so agreeable to the searcher after truth, is certain to add still further to the existing confusion in diagnosis and hopelessly to confound all intelligence in therapeutics.

The conservative position now held by the majority of writers upon syphilis is undoubtedly the safest one. It is this: syphilis is a blood disease, and chancre is its first symptom. Chancroid is a local ulcer and is not associated with any poisoning of the blood or productive of it. A conviction of the truth of these statements is the only safe guide to therapeutics. It spares the physician much confusion and many a patient years of unnecessary anxiety.

Practically, the doctrine is productive of much comfort, leaving very little room for annoyance to either physician or patient, and this annoyance only that of differential diagnosis of the primary lesion in difficult cases. This latter difficulty is always removed by observation during a few weeks, the loss of which is not material should the malady in the end prove to be syphilis.

Unity and duality in syphilis.—The foregoing consideration of the nature of the chancroidal virus leads so directly to the question of unity or duality in syphilis that a few words upon this subject will be more appropriate in this context than in its more natural position under the head of syphilis. The detail of the battles that have been fought over this question, with the array of cases on either side, is a wearisome matter. A full consideration of the long series of articles written upon it would take more space than this volume can afford, and would be flat and unprofitable to the general reader. An excellent array of the cases and arguments is presented by Bäumler in Ziemssen's Cyclopedia.

A résumé of the points which seem to be established at the present date is all that is appropriate here.

When syphilis first began to be written about, after the outbreak at the end of the fifteenth century, when it went under the name (generally) of the French disease, it was uniformly recognized as a new malady. It was not confounded with other venereal maladies known at that date, but was uniformly described as a *morbus* novus, inauditus, incognitus, etc. The writers who described it gave vent to their surprise in their words, and were unanimous in that expression. As Bassereau puts it: "There was one point upon which there was not the least difference of opinion between them; upon which the oldest, the youngest, the wisest and the most ignorant were of unanimous accord, namely: that none of them had ever observed anything analogous or similar to the *French disease* before the arrival of Charles VIII. in Italy."

Soon, however, writers began to compare the new disease with other venereal maladies, and finally, in 1551, Musa Brassavole united all the diseases together and included them in the history of syphilis.

From that time, the end of the sixteenth until the present century, the doctrine of syphilis was almost uniformly that of unity. Gonorrhœa, all sorts of vegetations and all varieties of local ulcers, were, along with the expressions of true syphilis, considered to be evidences of the action of some internal blood-poison, some humor. In England, the powerful brain of Hunter unfortunately fell into the wrong track in its interpretation of facts. Hunter had inoculated himself from an urethral discharge and got syphilitic chancre at the spot inoculated. His own case was published to the world; no one had thought of such a thing as an urethral chancre, and the identity of gonorrhœa and syphilis seemed to be established. Thousands of simple cases of gonorrhœa were salivated on account of this error, strengthened and sustained as it was by Hunter's unfortunate experience.

Ricord, in Paris, in translating Hunter's writings and making his own clinical observations, soon decided that gonorrhœa and syphilis were very different maladies, and he first clearly demonstrated the difference between them. This, indeed, is his greatest achievement.

Ricord also, by a close study of the primary lesion, detected differences in their physical characters, and noticed that some sores on the penis acquired in sexual contact were followed by evidences of general syphilis, while others were not. He did not clearly at first make out a difference in the originating cause of these ulcers, although he intimated it. He stated that all chancres were not alike: that some of them took on induration, while others did not; that those which became indurated were followed by general symptoms and called for general treatment, while those which remained soft were injured by mercury, did not call for anything except local treatment, and did not poison the blood.

In a thesis by Prieur,[1] Paris, 1851, even in his *Lettres sur la syphilis*, 1850, Ricord put out the first ideas of dualism in the syphilitic doctrine, intimating in the latter treatise, in regard to syphilization, that perhaps the induration in some chancres and its absence in others was due to a difference in cause, and, in the thesis, stating that in his experience the transmission of non-indurated chancre to healthy subjects always produced its like, while indurated chancre always recognized a similar lesion as its point of origin.

In 1852, Léon Bassereau, by a review of laborious confrontations, established the individuality of chancroid, and made it evident to the world that venereal ulcers belonged to two distinct families, the one non-indurated and local, the other indurated and followed by syphilis.

This is the doctrine of dualism. Clerc, following Bassereau, strengthened it. Ricord approved it formally in 1858, and gave it widespread circulation by the weight of the influence his high authority in venereal disease allowed him to exercise. Ricord had dissented from this view at first, but upon his adoption of it the adherents to the doctrine of unity of the syphilitic poison, *i. e.*, similarity of cause in the production both of the indurated and the non-indurated sore, received a blow from which they have never recovered.

Long years before this time inoculations had been practised—both auto- and hetero-inoculation. Hunter had established experimentally that

[1] Quelques questions sur la syphilis.

indurated chancre was not inoculable upon its bearer or upon another person already syphilitic, and syphilization had been practised since its discovery by Auzias Turenne in 1844, the pus being taken from non-indurated sores. Yet, in spite of a general knowledge of these facts, they were not correctly appreciated until the labors of Bassereau translated them and demonstrated dualism to the world.

Matters went smoothly enough for a time. The term dualism, however, was an unfortunate one. Its advocates did not mean precisely that there were two poisons in syphilis. On the contrary, they were unicists and believed that there was one and only one syphilis, and another distinct virulent disease, known under different names, but best recognized in this country by Clerc's denomination—chancroid.

The dualists became over-confident in the strength of their new position and began to make very bold assertions, allowing but little or no chance for exceptions.

The Hunterian chancre was spoken of a great deal, but it has turned out that this is one of the rather rare initial lesions of syphilis, the indurated erosion being more uniformly the point of entrance of the disease. Soft chancre and hard chancre came to indicate necessarily in the minds of many (as they still unfortunately do), the one a local non-syphilitic ulcer, the other always the point of entrance of syphilis. A final misfortune was the adoption of the tenet that a soft sore could be always auto-inoculated and a hard sore never, implying that anything which could be auto-inoculated was a chancroid. Then, that syphilis could only be due to infection by a hard chancre, etc., until the advocates of so-called dualism had so weakened their position by positive statements that their enemies threatened the integrity of the entire structure by picking flaws in every portion of the too confident argument.

It turns out now that competent observers are ready to testify on all sides that they see syphilis succeeding local ulcers which are not indurated. Cases are bountifully adduced to show that all sorts of purulent secretions are more or less inoculable, according to the quality of the secretion and the nature of the individual. Other cases show that, after repeated inoculation, chancroidal pus at last fails to take. Syphilitic chancres may be auto-inoculated, and such pus reinoculated may finally produce an auto-inoculable pus which does not necessarily contain the syphilitic poison. Many of the later lesions of syphilis are auto-inoculable. The auto-inoculation of syphilitic chancre may produce an abortive pustule, or a papule, or nothing. Syphilis may be acquired twice by the same individual. Finally, a chancre may be first soft, later hard, and be followed by syphilis; and again, a chancroid may be exceedingly hard and yet not at all followed by syphilis.

Cases have been adduced in support of all these facts, and still others to show that syphilitic chancre may follow inoculation of blood, or of secretions of secondary lesions, while phagedæna and suppurating bubo are shown to be not at all the prerogatives of chancroid.

In face of all these facts what justification can the doctrine of two poisons find—the doctrine, call it unity or duality—which claims that chancroid is one disease due always and only to inoculation of chancroidal pus, and syphilis another disease due always and only to contamination with the syphilitic virus, directly by the individual, or indirectly by inheritance?

In order to explain away these exceptional cases in so far as they threaten the above doctrine, without detailing all the cases, it will be ex-

pedient to note the deviations from the rules formerly considered absolute, and to accompany each by its explanation. Cases need to be referred to by name only. They are most of them well known, and have been so generally quoted and requoted in the different books written upon syphilitic subjects that the student can easily find them. This bird's-eye view will give a more comprehensive general understanding of the condition of the subject at the present day than any other which could be crowded into the space at hand. The following twelve propositions rest upon such positive proof that they can hardly fail to be accepted.

1. Chancroid upon a non-syphilitic patient is easy to communicate to any one, but in no such case among millions observed has the inoculation been followed by syphilis.—This bulwark of dualism has received no blow. It is as firm to-day as it was in the time of Bassereau's investigations.

2. A non-indurated ulcer may be the starting-point of syphilis.—Every surgeon of large experience sees this. It has been especially noticed in the female that the syphilitic chancre often remains soft, and the occurrence upon the male of a soft syphilitic chancre is not so infrequent as to be phenomenal. But, induration is only one feature of syphilitic chancre—a very common one undoubtedly, nearly constant; but the primary syphilitic lesion may exist without it. Scarlet fever without the rash is none the less scarlet fever. The so-called black measles (without a single pustule) is now known to be suppressed malignant small-pox in many cases, and it is none the less small-pox because the characteristic pustule is absent. If the other features of the chancre accord with the type, and syphilis follows, and the chancre has originated from contact with syphilitic poison, assuredly it is not a chancroid simply because it is soft. It requires more than one symptom to make a disease. A phagedenic syphilitic chancre is customarily non-indurated.

3. A chancroid may be indurated and not be followed by syphilis.—A hard chancroid is much more common clinically than a soft syphilitic chancre. The induration of chancroid, however, is inflammatory and not specific, and it is generally as easy to distinguish this inflammatory hardness from the induration of syphilis as it is to tell moonlight from sunlight. There are cases, however, in which it is impossible to make a diagnosis, if the induration alone is relied upon.[1] In such cases the prudent surgeon reserves his judgment until other signs have come to make a diagnosis for him. There are other symptoms of chancroid far more distinctive than the lack of hardness. A hard ulcer is by no means simply on that account a syphilitic sore.

4. Hunterian chancre so-called has come with many to signify syphilitic chancre. The truth is, that Hunterian chancre is only one of the varieties of initial lesion.—Other forms of the primary lesion are just as characteristic and just as syphilitic as Hunterian chancre, and one of the lesions is much more common, namely, the indurated erosion—not an ulcer at all.

5. A chancroid is not indefinitely auto-inoculable.—The capability of the skin to furnish ulcers upon local irritation of the proper sort has its limit. The early investigators were too positive in their state-

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[1] Such cases have been on several occasions brought before the New York Dermatological Society, a society reasonably expert in such matters, and have given rise to hot discussion, and sometimes to nearly an equal division of opinion among the members of that body, as to their probable syphilitic or non-syphilitic character.

ments about chancroidal pus. Truly it is very virulent. A patient in high fever[1] will take it; cancer, leprosy, syphilis, a previous chancroid, none of these prevent a take if chancroidal pus is properly inoculated. The syphilizers of Norway, however, following Auzias Turenne, have clearly demonstrated that the skin may be worn out in its capacity of responding to the repeated inoculation of chancroidal (or other pus). The same thing has been found to happen when the integument is kept long suppurating by other irritants—as by tartar emetic. After a period of rest the skin will again respond upon inoculation, and the patient may be again repeatedly inoculated until again the inoculation will no longer take.

These facts would seem strange did we not have analogies in common life. People who handle bees at first become poisoned when stung, and the wounded parts swell and inflame considerably. After a time, however, the stinging fails to produce any more local disturbance, and the sharp feeling, at the moment of being stung, is the only discomfort experienced. After a long interval, during which no bees are handled, the sting again produces inflammatory trouble.[2] In some individuals the same remarks apply to the bite of the mosquito.

Inability of the skin to produce pus upon inoculation does not, as the syphilizers have hoped, prevent it from absorbing the poison of true syphilis at once, as shown by Lindmann upon himself, and in Danielssen's case. The value of these cases to dualism is hard to over-estimate.

6. Pus, not chancroidal and not syphilitic, may be inoculated in generations, as it is called, may produce a series of auto-inoculable ulcers upon the same individual, the pus of the last ulcer being used to start the next one (Pick, Lee, Wigglesworth, Kraus, Reder, L. Vidal, Kaposi, Bidenkap, and others.)

Here again the enemies of dualism take advantage of the assertions of over-confident men, and endeavor to break down a very practical doctrine by a successful attack upon one of the outposts. But, although chancroid is an auto-inoculable ulcer, an auto-inoculable ulcer is by no means necessarily a chancroid. Impetigo and eczema produce suppuration by auto-inoculation of overlying integument sometimes—and are not on this account chancroids. All sorts of pus have been successfully used for this purpose, with the effect of demonstrating that some pus takes much more easily than other pus.

A great difference also is found in individuals: some take easily, some with difficulty, some not at all. Syphilitic persons and cachectic persons form the best subjects for inoculation. It is well known that some persons *fester* easily upon local injury, others with difficulty. A patient with cachectic ecthyma may be scratched with a clean pin and the spot may suppurate. It is well known that where the skin of such patients is subjected to injury, pus is very apt to be formed. The more or less irritating and contagious quality of all pus is getting to be a doctrine quite generally recognized by those who study inflammation.

After the inoculation of indifferent pus an ulcer has not been shown to be produced yielding a virulent bubo or giving pus so freely hetero-inoculable as chancroidal pus. The latter will take as brilliantly, when applied for the first time, upon the healthiest tiller of the soil, as upon the most cachectic inmate of a hospital.

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[1] Keyes (Van Buren and Keyes): Genito-urinary Diseases, with Syphilis. New York, 1874, p. 478, note.

[2] These facts were communicated to me by a gentleman who raises bees.

7. A syphilitic chancre may be auto-inoculated, producing an abortive pustule, an auto-inoculable ulcer, or, after a time, a papule. (Bidenkap, Boeck, and many others.)

Generally, the old rule holds good, and the auto-inoculation of syphilitic chancre is negative in its result. This rule, however, has many exceptions. The syphilizers and Henry Lee have abundantly proved that almost any syphilitic chancre may be rendered freely auto-inoculable by rubbing it with savin ointment, or putting tartar emetic on it, or running a seton through its base—in short, by rendering its suppuration abundant and creamy. Here it is evidently the pus which is the irritating agent, and not the secretion of the chancre. The syphilitic chancre of pure type does not suppurate at all, and the inoculation of its serous discharge does not produce an auto-inoculable ulcer. It may give rise to an abortive pustule, as may any local traumatism in some patients; but in the vast majority of trials failure will be absolute.

There is nothing strange, again, in the fact that such chancres worried into suppuration become auto-inoculable, since the pus of scabies, the pus of ecthyma, have the same effect, not only upon syphilitics, but upon some non-syphilitics. And finally, the occasional production of a hard non-suppurating papule by auto-inoculation from a syphilitic chancre is not very strange. If the inoculation be practised very early, before the body is saturated with syphilitic poison, another chancre is the result. Just as multiple primary inoculation to any extent upon a healthy person will produce as many chancres as may be desired. The same fact is noted clinically in cases of multiple syphilitic chancre.

Later on the papule, or the papular or pustular eruption produced by auto-inoculation of syphilitic chancre, is simply a local lesion, a local expression of syphilis called out upon the skin by a traumatism. It is well known that a blister upon a patient with latent syphilis may call out an eruption. Vaccination may do the same thing. I have frequently seen local prolonged pressure in a syphilitic case produce a local papule (*e. g.*, from the shoe about the ankle). I have seen the wearing of an indifferent plaster upon the skin call out papules. A wound will sometimes do it. The irritation of tobacco notoriously produces mouth-lesions in syphilitic cases, as does the irritation of a broken tooth. Lack of cleanliness about the anus and the genitals is a fertile cause of condylomata and mucous patches. If then all sorts of irritants acting locally, mechanical and chemical, upon syphilitics, can produce lesions, why may not the scratch of a lancet, or the inoculation of the poison of syphilis, as contained in the discharge of the primary lesion, do as well.

8. A syphilitic chancre, by hetero-inoculation upon a healthy subject, may produce nothing, or an abortive pustule not followed by syphilis.—Possibly it may produce an ulcer itself auto-inoculable, which gets well and is succeeded by an indurated ulcer after incubation followed by syphilis. This occurred in Danielssen's case. The explanation is simple. The patient was in a pus-forming condition. Any pus would have done as well as the pus from the irritated chancre used. An auto-inoculable ulcer resulted at once, and got well. Then followed true syphilitic chancre and its appropriate sequence, syphilis.

The cases adduced to support the first part of this eighth proposition are meagre in number (seven) and scant in detail. Five of them are by the anonymous physician of the Palatinate. Of these, three produced pustules and inflamed; one sloughed; two produced, the one tubercles (ulcerating), the other ulcers after thirty-six and forty-two days' incubation.

These cases are difficult to explain. In the first three the hypothesis of possible error as to the nature of the source of the poison might be entertained, or previous syphilis in the inoculated person, or some possible incapacity on the part of the one inoculated to receive the poison. In the last two the long incubation and the local developments make it probable that they both acquired true syphilis by inoculation, and that general symptoms of the ordinary kind did not follow. This we observe sometimes clinically, especially in the case of women who get syphilis from their husbands. No eruption and no obvious symptoms follow the infection during the early period, while subsequent developments confirm the existence of syphilis. Both of the last two cases here referred to were women (the tenth and thirteenth cases of the anonymous Palatinate).

The two other cases of syphilitic inoculation not followed by syphilis were those of Boeck and von Rinecker. The former was the case of a woman. Large superficial pustules, auto-inoculable in three generations, followed, and no general symptoms. This looks like the result of the inoculation of an irritated syphilitic chancre, where the pus alone took and the syphilitic poison did not. The chancroidal pus would have been auto-inoculable in more than three generations, and the possibility of inoculating true syphilis negatively has no stronger theoretical objection than the negative inoculation of vaccine virus—and the latter is well known to occur very often.

Von Rinecker's case was that of a boy of twelve, who was inoculated from a primary lesion. The incubation was twenty-seven days, the result a tubercle without general symptoms afterward, and the conclusion (for it was a take) is either that the boy had inherited syphilis, or was one of the anomalous cases already referred to, and undoubtedly occasionally encountered clinically, where no general symptoms followed the primary lesion within the customary period.

These cases are important ones, and it may seem like begging the question to try to theorize them away. But, even granting them all to be what their authors claim, they are only exceptions among so many. Exceptions prove rules because observers are not omniscient, and certain conditions which seem to be fulfilled must sometimes fail in spite of all our efforts to detect the whole truth. The grouping of a certain series of phenomena following certain causes constitutes a rule in the eyes of all men, and no rule is more plentifully upheld by examples than that one which states that the inoculation of the secretion of a syphilitic chancre upon a healthy person produces, if anything, syphilis.

Between forty and fifty cases are on record in which syphilitic secretions have been experimentally inoculated upon healthy persons. Among these, seven are exceptions, the rest follow the rule. Confrontations certainly number thousands, and syphilis, when traced up, is always found to be derived from syphilis in another. It does not arise de novo.

Vaccine virus is well known to be contagious, yet no one is astonished when its inoculation sometimes proves abortive. In the epidemics of vaccinal syphilis, only a certain proportion of the children vaccinated get syphilis. Even chancroidal virus (much more irritating and virulent than the syphilitic poison) occasionally fails to take, probably because inoculation is not properly performed, possibly on account of an idiosyncrasy of the patient. Hübbenet,[1] of Kiew, reports two cases where he uniformly failed to get a positive result from the inoculation of chancroidal pus.

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[1] Die Beobachtung und das Experiment in der Syphilis. Leipsic, 1858, p. 11.

I have now a patient under treatment who acquired his disease from a woman with whom a personal friend consorted a few moments later and received no harm therefrom, and instances of this sort are by no means uncommon.

The blood of syphilis is known to produce a syphilitic chancre by inoculation, and this proposition is not at all invalidated, because seventeen out of the twenty-three reported cases of inoculation of syphilitic blood gave negative results. The poison was doubtless more dilute in these cases, or the inoculation improperly performed.

If the inoculation of syphilitic virus upon an uninfected person may prove abortive—and the inoculation of indifferent purulent secretions upon some people may give rise to ulcers, auto-inoculable in generations—then these exceptional cases lose all their value, in so far as they controvert the doctrine of two poisons: one, sui generis, for chancroid; the other, specific, for syphilis.

9. Secretions derived from auto-inoculable ulcers, which latter have been originated from pus first taken from an irritated syphilitic chancre, may by hetero-inoculation produce an auto-inoculable ulcer, not followed by syphilis.—This assertion rests upon Bidenkap's case, which has already been discussed and a possible solution offered (p. 4).

10. The pus from many of the later lesions of syphilis is auto-inoculable, producing auto-inoculable ulcers (upon the syphilitic patient) just as other indifferent, non-poisonous pus will produce a similar result, more or less marked in degree, according to the quality of the pus (Pick, Melchior Robert, Koebner, Boeck, Bidenkap, Clerc, Fournier, Lee, and others).—What has already been said in this chapter covers this point; no further explanation is necessary.

11. Vaginal secretions, taken from syphilitic women having no ulceration of the genitals and auto-inoculated, produce auto-inoculable ulcers upon these women resembling chancroids (Morgan, of Dublin).—The same reasoning in explanation applies here as that alluded to under head 10.

12. A mixed chancre (Rollet) exists possessing the physical qualities found in ulcers produced by both of the poisons.—It will be described later. It exists clinically. It has been produced experimentally. (Melchior Robert, Lindwurm, Basset, Laroyenne.)

Discussions upon the existence of one or two poisons for the different sores will doubtless never cease. They are of value to the cause of science, but unfortunate if their conclusions lead to the practice of treating all venereal sores alike.

One may readily accept without damage the doctrine that there is only one poison—that poison syphilis, while chancroid is only a common ulcer auto-inoculable, but not in any sense poisonous. This conclusion cannot lead to practical harm. The doctrine which intimates that there is but one poison—syphilis, and that that poison produces sometimes chancroid, sometimes syphilitic chancre, must be pernicious in its results, and lead to years of needless dosing in the case of patients who require only local treatment.

CHAPTER II.

CHANCROID.

DESCRIPTION OF ITS SPECIAL FEATURES AND OF THE VARIATIONS TO WHICH THEY ARE LIABLE.

Pathological Histology of Chancroid; Comparative Histology of Syphilitic Chancre and of Chancroid.—Transmission of Chancroid to Animals.—Transmission of True Syphilis to Animals.—The Relative Frequency of Chancroid.—The Methods of Chancroidal Contagion, Direct and Mediate.—The Inoculation of Chancroid.—Auto-inoculation and Hetero-inoculation.—Case illustrating the Diagnostic Value of Auto-inoculation.—Inoculation in Generations.—How to Practise Experimental Inoculation.—The Incubation of Chancroid; Variation in Incubation.—Course of Chancroid; Period of Increase; Stationary Period; Period of Repair; Variations in Course.—Situation of Chancroid; Variation in Situation.—Number of Chancroids.—Form of Chancroid; Variations in Form.—Follicular Chancroid.—Subjective Symptoms of Chancroid.—Condition of the Base.—Duration of Chancroid; Variations in Duration.—Cicatrix of Chancroid.

Pathological histology of chancroid.—The minute structure of chancroid, as revealed by the microscope, presents nothing special. That quality which constitutes the virulence of chancroid does not become evident by being magnified, nor does it impress any property upon the elements composing the ulcer peculiar to itself. Many efforts have been made to establish points of comparative diagnosis, by the aid of the microscope, between chancroid and chancre, but without any success that can be practically utilized. Biesiadecki found very little difference. The tissues of the cutis and the lower cells of the epidermis are swollen in both instances, the adventitia of the blood-vessels is said to be more dense in syphilitic chancre and the walls of the capillaries thickened (Biesiadecki), the lumen of the thick-walled vessels becomes diminished. The tissues in and around the ulcer in both cases are filled with nucleated cells crowded together in the meshes formed by separation of the bundles of connective tissue. These cells soon render the line between the cutis vera and the mucous layer of the epidermis indistinct, and the epithelial layer becomes thinner. Following this, ulceration may ensue.

Verson believed the induration in syphilitic chancre to be due to new formation of connective tissue; but the tissue is not peculiar in any way. Buhl found the blood-vessels enlarged and their coats infiltrated in chancroid as well as in chancre. Auspitz and Unna[1] (the latest in the field) attempt to make clear the characters distinguishing syphilitic chancre from chancroid; but they do not succeed in doing more than the unaided eye had done before, and certainly point out nothing pathognomo-

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[1] Die Anatomie der syphilitischen initial-sclerose. Separat abdruck aus der Vierteljahresschrift f. Derm u. Syph. Wien, 1877, pp. 161.

nic—nothing which could be relied upon to help the clinical inquirer, even if he cut out the initial lesion to study it up in a case of doubt.

They confirm the thickening of the adventitia of the vessels noted by Biesiadecki (and frequently found elsewhere by other observers). They speak of the cellular infiltration and of the hypertrophy of fibrillary connective issue. This fibrillary material Unna[1] says is pure collagen. He thinks this gives its hardness to syphilitic chancre, that it is most marked in the adventitia of the individual vessels. He believes that the starting-point of the disease is in the vasa vasorum, endothelial changes coming later. Where there are no vasa vasorum the adventitia is the point of origin of the process. The lymph-spaces disappear in the fibrous felting of the skin, while round-celled infiltration is general. Frequently there is absence of true ulceration and very often there is actual preservation of the epidermis over the lesion, which sometimes even increases in thickness and grows downward, sending off lateral shoots.

In all this description there is surely nothing which may not be imitated by other processes not syphilitic. Nothing specific has been found, and most of these facts were presumed before the microscope was brought to bear upon these special lesions, for true chancroid is an ulcer, true syphilitic chancre often is not.

Transmission to animals.—In 1844, Auzias Turenne succeeded in producing a number of positive takes upon different animals by inoculating them with chancroidal pus. Robert de Weltz, six years later, took pus from chancroids which he had produced by inoculation upon a cat and a monkey, and inoculated his own arm four times, with success. Turenne inoculated chancroidal pus in generations upon animals, and found that ulcers soon failed to be produced. The peculiar virulence of chancroid, it appears, does not long continue upon the soil furnished by the tissues of the lower animals—a rather peculiar fact, when it is remembered with what ease profuse suppuration is set up in some of them (the rabbit). Turenne, on account of his discovery that the virulence of chancroid died out by repeated auto-inoculation, and believing that chancroid was syphilitic—for he was a unicist—established the doctrine of syphilization, an attempt to cure syphilis by repeated and exhaustive inoculation of chancroid—a doctrine which with some modifications exists even at the present day, in spite of the death of its sturdy advocate, Boeck. Turenne was consistent in his practice with his theory. He made no public confession of what he was doing, but he undoubtedly syphilized his own body, which at his death is reported to have been covered with scars.

In the light of modern inoculations it may be contended that the auto-inoculable sores produced upon animals were not chancroids, but ulcers—not poisonous, auto-inoculable in generations, like the ulcers produced upon a cachectic person by the inoculation of acne-pus; and the fact that Weltz produced ulcers upon himself by re-inoculating this pus from the animal back to himself would not in the least oppose such a conclusion. Two recorded circumstances, however, carry conviction that the poison of chancroid is transmissible to animals, develops there, and may be carried back again and successfully inoculated in man. The two cases are those of Ricordi and Diday: the former produced a chancroidal bubo (a virulent, not a simple bubo), in a rabbit, while Diday, in 1851, by inoculating his

[1] Vierteljahresschrift f. Derm. u. Syph. 1878, p. 543.

own penis with pus derived from an ulcer which he had originated by inoculating chancroidal pus upon the ear of a rabbit, produced a chancroid upon himself. His chancroid soon became phagedenic, and was attended by suppurating (not virulent, however) bubo.

Up to the present time a distinguishing mark between the poisons, claimed by the advocates of two poisons, has been that chancroid could be transmitted to animals, while syphilis could not. Numerous attempts at inoculating syphilis had been made, but they invariably failed to demonstrate that any animal could acquire syphilis. Depaul's syphilitic monkey and the cachectic syphilitic cat of Vernois have not been regarded as more than effects of a vivid imagination. It may be, however, that the judgment of the profession on this point also must be modified if the recent discovery made by an eminent scientist is confirmed by future investigation.

At a meeting of naturalists [1] at Cassel, in 1878, Klebs announced the discovery of a parasite, the cause of syphilis. The microscope showed him certain slowly moving little rods in freshly extirpated Hunterian chancres. From these by cultivation he produced a plant composed of stationary rods terminating in spiral prolongations of jointed rods. By inoculating these cultivated helikomonads, as he calls the plants, upon an ape, he produced symptoms resembling syphilis. By inserting under the skin of another ape a piece of a syphilitic chancre, he claims to have produced symptoms upon the integument, in the mouth, the bones of the skull, meninges of the brain, etc.—tissue-changes identical with those produced by syphilis in man, while from the blood of this ape he cultivated a plant resembling that inoculated upon the first ape.

These new discoveries will doubtless be at once tested. Should they prove accurate, another distinction between chancroid and syphilitic chancre, formerly relied upon by the dualists, will have disappeared.

The relative frequency of chancroid.—The poison of chancroid is more virulent than that of syphilitic chancre; it takes more easily, as proved by the number of negative results attending inoculation of syphilitic blood upon healthy persons, and the free auto- and hetero-inoculability of chancroid. Chancroid may recur indefinitely in the same individual. Hence, it is to be expected that chancroid will be found more frequently than chancre, and all statistics drawn from hospital experience prove this to be the case. Puche's statistics of ten thousand from the Midi Hospital credit nearly a clear eighty per cent. of the cases to chancroid, and the statistics of the Plymouth Naval Hospital give seventy per cent. The practitioner among respectable people, however, is astonished at the small number of chancroids he encounters. Herpetic troubles are certainly more common than anything else—taking the world at large; and Fournier, out of three hundred and thirty-four cases in his own private practice, only encountered eighty-two chancroids. The statistics of Fournier, quoted by Lancereau (2d ed., p. 82), and doubtless covering hospital cases, credits chancroid with a little over sixty-six per cent. of the whole number reported.

The conclusion is, as Fournier pointed out, that the greater care and neatness exercised in the higher classes protects them in a measure from chancroid, but offers no gurantee against infection by the seemingly less formidable primary lesion of true syphilis. The conclusion becomes especially obvious on considering the fact that mucous patches, which

[1] Allg. Wien. med. Zeitung, Oct. 15, 1878, p. 418.

may lie concealed high up in the vagina, and last for months at a time, are as capable of communicating syphilis as is the true syphilitic chancre.

The manner of contagion.—The chancroidal virus is not volatile. Chancroid is only possible by contact of chancroidal pus with a surface deprived of epithelium. Cullerier's famous experiments show this. Two women were found with no lesion of the vagina in either case. The vaginal secretions were auto-inoculated without effect. Chancroidal pus was placed in the vagina, where it remained thirty-five minutes in one case, nearly an hour in the other. Then the contents of the vagina in each case were successfully auto-inoculated. In both the vagina was washed with an astringent solution, and in neither did any vaginal ulcer follow.

The surgeon knows well that, so long as there are no cracks in his fingers, he may handle chancroidal pus with impunity.

There is one exception to this rule, namely, where chancroidal pus is placed upon healthy epithelium, remains there undisturbed, erodes the epithelium by virtue of its acridity, and thus prepares a way for the absorption of the virus. In this way chancroids of long incubation are explained; and in a similar way the follicular chancroid, in which a few leucocytes bearing chancroidal virus are believed to be rubbed into the mouth of a healthy follicle, and thence gradually to erode a way by which contagion becomes possible through the thin wall of the follicle underneath the surface of the superficial epidermis. The period of incubation in this case is also generally long.

The methods of contagion are two, direct and mediate.

Direct contagion.—In direct contagion the source supplying the pus and the part inoculated come into direct contact. This is the usual way. In sexual intercourse, when a chancroid upon an individual inoculates a portion of overlying contiguous integument, when a fissure on the physician's finger becomes contaminated while practising the vaginal touch—these are all instances of direct contagion.

Mediate contagion.—This means that there is an intermediate carrier of the pus which receives it from its source and deposits it where it finally takes root. The vagina may be the medium of contagion receiving the pus from one man to give it up to another immediately without itself becoming contaminated. Cullerier's cases prove the possibility of this—but it must be very rare. The prepuce may play a similar intermediate part. The lancet of the surgeon gives rise to mediate contagion in cases of inoculation.

Inoculation of chancroid.—The pus of chancroid remains virulent until the ulcer is healed, but decreases in virulence toward the end. A single corpuscle is believed to be capable of producing a chancroid by inoculation. Frozen and corked up in bottles, the pus retains its virulence for a long time (Boeck). Boiling heat, acids, alkalies, corrosive sublimate, alcohol, decomposition—all destroy the virulence of the pus. Boeck believes that dried pus is inert; Sperino taught the contrary. Inoculation is spoken of under two heads—auto- and hetero-inoculation.

Auto-inoculation is the inoculation of the patient with the secretion of the chancroid he himself bears. This is generally effected purposely as a test by the surgeon. It may take place by contact of adjacent surfaces. In such a case it is called spontaneous auto-inoculation. Auto-inoculation as a diagnostic test is not so commonly employed now as formerly. As a test it is thought to be deceptive, since so many other kinds of pus produce ulcers upon some persons. These latter ulcers are not chancroids, but they secrete pus and are apt to deceive. Chancroid, moreover, is so

well understood now to be harmless and unproductive of syphilis, that in cases of doubt it may be observed for a time, or treated at once, as the surgeon chooses, without calling for any internal medication or disturbing the patient's peace of mind in the future, should no symptoms follow.

Yet auto-inoculation is still an excellent resource in many cases, the frank take of the true ulcer being very characteristic and always easy to obtain upon a fresh subject—a fact which cannot be affirmed to the same extent about any other kind of pus. In the following case, on one occasion it proved of great value.

In midsummer, a thin apothecary came to me with an oval ulcerated fissure at the edge of a somewhat tight prepuce. This prepuce he pulled back twenty times a day in order to inspect the ulcer better. His wife was away. He was greatly frightened, and in such a state of depression that he could neither eat nor sleep. The fissure was several weeks old, suppurating only moderately. It did not look very virulent, and I assured the man that his fears and his manipulations were keeping the ulcer in existence, and that it would get well if let alone. Weeks passed, however, and it did not get well under simple medication. It did not spread and there was no bubo. I sent him for an opinion to a number of surgeons of eminence, and all agreed that the ulcer was a simple one, kept up by the weakness and anæmia of the patient, and the position of the sore.

Finally the patient's wife was about to return and he was convinced of the simple nature of his sore, which had now lasted many weeks unchanged. I inoculated him twice on the forearm, mainly as an experiment. In three days the inoculated points became two brilliant typical chancroids.

The wife was detained away by a telegraphic excuse, and a single cauterization with fuming nitric acid cured all three ulcers promptly, the character of the ulcer on the prepuce changing immediately on the fall of the slough.

Inoculation in generations is repeated inoculation of pus from one source, taking the supply for each fresh sore from the one last produced, until the pus no longer takes on the same individual. Fresh pus derived from a new parent source may now start a new process of inoculation in generations upon the same patient, and then again fresh pus, until at last the skin will no longer take, and abortive pustules at best, or nothing results, from any fresh inoculations. This much syphilizers have proved, and the process they have adopted is the one just described.

After a patient has been "syphilized," as it is called, and has a rest, he may be syphilized again, since the skin recovers from its immunity.

Thus it appears there is a limit to auto-inoculation, but no one knows how long one would continue susceptible to inoculation were only one chancroid created at a time. Lindmann certainly reached twenty-seven hundred, and was still succeeding when last reported; and practically (certainly for clinical purposes), it may be affirmed that there is no limit to to the susceptibility of an ordinary individual to chancroidal virus. He may take as often as he is exposed.

The method of inoculation of syphilizers is perhaps the best. A minute portion of pus is taken on the point of a lancet, and held at right angles to the skin at the point selected for inoculation. The tip of the lancet is made to penetrate just below the epidermis, rotated, withdrawn, and its point is wiped off upon the minute wound. Extensive scarifications are to be avoided, since they produce large, irregular sores, and not the round typical chancroid.

The point most suitable for auto-inoculation for diagnostic purposes is the breast below the nipple. Here the skin resists a take. A true chancroid will undoubtedly always take here, but the resulting sore is not apt to be troublesome, and phagedæna is almost unheard of in this region. The head and face are peculiarly bad soil for a take, and would be proper sites for auto-inoculation, except for the fact that severe chancroids do sometimes occur in these regions, and the resulting scar is disfiguring. Chancroids have been repeatedly produced on the face by auto-inoculation, and the ancient notion that all venereal ulcers on the face are necessarily syphilitic is not accurate. The upper and outer part of the thigh is also a good site for auto-inoculation for diagnostic purposes. It is out of the way of the absorbents, and not likely to inflame excessively, or to become complicated in this region. Over the insertion of the deltoid in the arm is another good site.

Hetero-inoculation is the inoculation of pus from one patient to another, as practised by syphilizers. Chancroid, as found clinically, is also the result of hetero-inoculation.

Incubation of chancroid signifies the time which elapses between contact with the poison and the appearance of the ulcer. If we had microscopic eyes, we should recognize, probably, that changes in the tissues commence immediately upon contact of the virus with a denuded surface. As it is, by the end of twenty-four hours, the inoculated point is distinctly red, during the second or third day a pustule forms, and generally by the third day, if the pustule be broken, a fully formed minute chancroid, possessed of all the characters of the typical ulcer, is found, with its abrupt margin, suppurating floor, soft base, pink areola, etc. Boeck says that the pus is contagious, taken from the pustule on the third day. Clinically the same holds good, and the incubation of chancroid is placed at two or three days, very rarely longer. When first found by the patient, it is generally already an ulcer or an exulcerated fissure. Sometimes it is a pustule.

Variation in incubation.—Clinically, incubation may reach a week, possibly ten days. This occurs in cases of follicular chancroid, or when the pus has been deposited upon unbroken epithelium and has to erode its way through before a take can be effected. Sometimes the ulcer is not found by an unobservant patient until many days have elapsed, because it has caused no pain, and has not attracted attention. Such a patient, on finding a large ulcer by accident, will think it impossible that such a sore could have escaped his attention had it existed the day before, and he will declare that it has just appeared, and resent the suggestion that he has overlooked it.

Course of chancroid.—Uncomplicated chancroid tends to run through three definite periods: the period of increase, the stationary period, the period of repair.

Period of increase.—This lasts one or two weeks, occasionally a little longer. The ulcer increases in size, preserving absolutely its characteristic features. It generally stops when it reaches about one-fourth of an inch in diameter, but may rapidly spread to the diameter of an inch or more.

Stationary period.—During about two weeks, sometimes longer if unmolested, the ulcer tends to remain absolutely stationary, not undergoing any change that can be appreciated. In persons not very susceptible to the poison, very often toward the end of a course of syphilization the stationary period does not exist, but repair sets in after the ulcer has reached a certain size.

Period of repair.—This comes on gradually. The floor of the ulcer grows more pink and even, the edges become sloping, and cicatrization advances slowly from the circumference toward the centre.

Variations in course.—Many of the deviations in the typical features of chancroid lead to variations in its course. They will be considered under the heads of relapse, inflammation, phagedæna, gangrene.

Situation of chancroid.—Chancroid is commonly found in the furrow behind the corona glandis on the penis of the male, and posteriorly in the fourchette of the vagina of the female. A natural pocket exists at these points, the epithelium is soft there, and abrasions not uncommon, especially along the side of the frenum in the male. In this situation chancroid frequently ulcerates its way beneath the frenum, and sometimes perforates the urethra. The pus naturally gravitates to the fourchette in the female.

Variation in situation.—No portion of the body is exempt from inoculation by chancroid. The head and face, once considered exempt, has been proved not to be so by numerous syphilizers. R. W. Taylor has shown that, clinically, chancroid upon the head may be of exceptional severity, and three very interesting cases of phagedenic chancroid of the face are reported by Profeta, of which the first is especially striking. A serpiginous chancroid, lasting two years, had occasioned extensive ravages upon the face. The patient had inoculated his own hand while handling the sore, and Profeta inoculated himself from the ulcer with positive result. Hygiene, with local stimulants, cured the ulcer promptly.

Chancroids are common anywhere upon or within the prepuce in the male, the ostium vaginæ in the female. At the orifice of the urethra they are encountered in both sexes, and they are apt to be sluggish in their course in these situations. Chancroid deep in the urethra of the male is very rare. They are also rare deep in the vagina, but have been observed upon the neck of the uterus, and (Delmas and Combal) within the uterus. The anus and rectum are the seat of chancroid either communicated *a preposterâ venere*, or, in the female, due to spontaneous auto-inoculation, the chancroidal pus trickling down over the anus from the vaginal fourchette as the patient lies upon her back. The fingers of the surgeon and of the patient with chancroid are apt to become poisoned accidentally.

Number of chancroids.—Clinically, chancroid is multiple among hospital and dispensary patients, often solitary in the better classes, who are more scrupulously clean. If multiple abrasions have been simultaneously poisoned during sexual intercourse, the resulting ulcers will naturally be multiple from the first. Often, however, but one sore comes out at first, and this by spontaneous auto-inoculation produces many similar sores in the immediate neighborhood. Around the anus, and at the margin of the prepuce, chancroid is nearly always multiple. When chancroid is multiple from the first, the numerous ulcers are apt to be small. Single chancroid is generally larger. Sperino found in practising syphilization that, the greater the number of points of simultaneous inoculation, the smaller was the relative size of the resulting ulcers. He utilized this discovery in lessening the size of the scars of his patients, whom he syphilized.

Form of chancroid.—The typical chancroid has been described (p. 2). It is round, or may be unsymmetrically irregular on account of the situation, or the shape of the abrasion or fissure inoculated, or on account of the running together of several chancroids of different sizes,

in which case its border is described by segments of uneven circles. Multiple chancroid of the anus is stellate.

Variations in form.—Instead of being an open ulcer, chancroid sometimes remains scabbed over. The thick pus dries up on the surface, but continues to be formed beneath the scab, from the sides of which it oozes under pressure. It advances by the formation of new rings of pus under the epidermis around the old scab, and generally has a livid areola outside of all. It resembles rupia, is by no means common, and is called ecthymatous chancroid. Lift off the crust in such a case, and the characteristic ulcer will be revealed.

Follicular chancroid.—In this form of chancroid, infection takes place through the mouth of a healthy follicle, into which a few pus-cells have been rubbed. It is a clinical chancroid, and cannot be produced artificially. Inoculation takes place beneath the plane of the surface epidermis, and if the latter happens to be tough, it retains its integrity for a considerable period after the tissues beneath it have been melted down into pus.

Therefore, when seen it is a large acuminated pustule, often covered by a peculiarly dense epidermis. The lesion varies in size, and is full of thick pus. Suppuration tends to spreads peripherally beneath the epidermis until the latter has broken. By cutting away the thickened epidermis the typical chancroid is disclosed. The incubation of follicular chancroid is long, as already stated. The lesion is uncommon. I have seen three cases all on the genitals. Two of them were sent for inspection from the Bellevue Dispensary, by Dr. E. A. Banks, of New York. The largest was nearly a half-inch in diameter at the base, and elevated quite a third of an inch above the surface of the integument.

Subjective symptoms of chancroids.—There are none in a typical case. An uninflamed, uncomplicated chancroid is not painful. It itches or prickles somewhat at times, but nothing more. If, however, from its position it is subjected to irritation (anus, end of penis), or from local applications or other cause it becomes at all inflamed, then it becomes painful, more or less so according to the individual and the amount of inflammation. Practically, chancroid rarely exists clinically free from irritation, and it is generally, therefore, found to be painful, sometimes acutely so. A rapidly spreading chancroid is painful, as is also a chancroid when attacked by gangrene or phagedæna.

Condition of the base.—The base of an unirritated chancroid is soft. If inflamed from irritation, it becomes hard, indurated, and feels as a small boil in the skin sometimes does. This induration sometimes cannot be distinguished with certainty from the induration of syphilitic chancre. Generally, however, the difference is striking. The induration of chancroid is manifestly an inflammatory affair. The integument is discolored for a certain distance around the edge of the ulcer, with a distinct inflammatory blush. The tissues give to the fingers the sensation of being matted together, glued to each other and to the surrounding parts. The edge of the induration is not sharply defined, but fades away insensibly into the surrounding tissues. The hard mass is adherent to such portions of integument as override it, and often closely attached to the parts beneath. Pressure upon the induration causes pain.

How different is all this from the typical induration of a syphilitic chancre—that tense, elastic, insensitive, non-adherent, sharply defined underlying induration so familiar to the fingers once accustomed to it, and yet so difficult to be certain about in all cases in which it is imperfectly

developed. The induration of syphilitic chancre often precedes the ulcer, or occurs simultaneously with it. That of chancroid always follows the ulcer.

Duration of chancroid.—A typical ordinary chancroid untreated lasts in most individuals from four to eight weeks, according to its size. If very small, it gets well perhaps sooner. The larger it gets the longer time does it require for cicatrization. Abortive pustules and imperfect "takes" get well in a few days. Toward the end of a series of auto-inoculations in syphilization, when the virulent quality of the pus is dying out, the ulcers grow smaller and get well sooner.

Variations in duration.—Irritated and inflamed chancroids are slow in getting well. To this class belong all chancroids about natural orifices or where motion is apt to disturb them, such as chancroids of the anus, of the meatus urinarius, of the orifice of the prepuce, upon the back of a knuckle. Extensive chancroids of the vagina and rectum in the female, and of the rectum in the male, sometimes last indefinitely. They cease in the end to be true chancroids, and their pus ceases to be auto- or hetero-inoculable. Their bases become indurated, they remain in part cicatrized (chancroidal structure of the rectum), in part ulcerated, and frequently pass for tertiary syphilitic ulcerations. Bois de Loury and Costilhes[1] have described some forms of these ulcers. Differential diagnosis between them and syphilitic similar lesions and some forms of epithelial cancer is sometimes very difficult. Internal treatment does not affect them. Local stimulating treatment sometimes cures them. Bridge, of New York, cured a bad case in the rectum, on one occasion, by lumbar-colotomy. In the vagina excision is the best treatment. These ulcers are rarely encountered except in the wards of a large hospital. Charity Hospital of this city always has a number of them in its wards. They are customarily found upon the persons of old prostitutes.

The duration of chancroid is greatly influenced by phagedæna. Fournier has reported a case lasting fourteen years.

An uncomplicated chancroid occasionally relapses, often without obvious cause. This is by no means common, but it has been noted, and it is possible for a chancroid which has almost cicatrized to break down again into ulceration and spread possibly to the same extent as before, or even farther.

Cicatrix of chancroid.—An ordinary uncomplicated chancroid may fail to destroy the papillary layer of the integument, and in such case no scar is left. Generally the scar is quite visible, especially when occurring upon the outer integument, and, of course, once formed it is permanent. It is generally thin and smooth, never pigmented.

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[1] Des ulcérations chroniques, ou chancres chroniques des parties génitales de la femme. Paris, 1845.

CHAPTER III.

CHANCROID.

DIAGNOSIS, PROGNOSIS, AND TREATMENT.

Diagnosis.—Diagnostic Table of Chancre, Chancroid, and Herpes.—Ulcerated Non-virulent Abrasions.—Different Varieties of Pseudo-chancre and their Treatment.—Six Propositions of Importance bearing upon the Question of Auto-inoculation for Purposes of Diagnosis.—The Prognosis of Chancroid.—The Treatment of Chancroid.—Prophylactic Treatment.—Radical Treatment.—The Reason why Cauterization will not always arrest a Chancroid.—How to cauterize a Chancroid.—Palliative Treatment of Chancroid.—Iodoform and its Use, and other Topical Applications.—Anal and Rectal Chancroids.—Urethral Chancroids.—Sub-preputial Chancroids.—Chancroid at the Margin of the Prepuce.—Chancroid of the Vulva and Vagina.—Chancroid of the Fingers.

For clinical purposes the differential diagnosis of chancroid is with syphilitic chancre, and with that alone. The doubt may arise as to whether a given lesion be a chancroid, or a solitary herpetic ulcer, or an ulcerated abrasion; and, although scientifically these points are interesting and important, they are not paramount.

It is only possible to make a differential diagnosis clear within short limits of space by arranging the typical features of the lesions under comparison in the form of a table.

Although syphilitic chancre is to be described later on, yet it is expedient to place a short diagnostic table here, on account of the context. This table only deals with the important broad typical characters of the two sores. For closer details of the minor features of syphilitic chancre in differential diagnosis, the reader is referred to the more extensive table later on.

A diagnostic table, to be accurate, must be minute in detail; but this minuteness destroys its value for clinical purposes to the student, who wants the broadest possible distinctions, clearly made and strongly contrasted. It is therefore expedient to give two diagnostic tables, the first broad, clear, short, referring to the typical ulcer, and not considering exceptions or complications; the second, more in detail, for fear that the first might lead into error. But few points, and those cardinal, will be made in the first table, that it may be a sort of primer of diagnosis for virulent venereal disease. It seems best to include herpes in the first table. The second table will be given after a description of syphilitic chancre.

A diagnostic table cannot cover all the ground, and it is not intended to do so. It is in the main accurate for typical cases only, and its function is to serve somewhat as does a diagrammatic chart. A table of this sort is sometimes of very great value, but it cannot be depended upon in exceptional cases.

Diagnostic Table of the Distinctive Features upon the Genitals of Pure Typical Cases of

SYPHILITIC CHANCRE.	CHANCROID.	HERPES PROGENITALIS.
1. *History.*—Sexual contact with a syphilitic chancre or mucous patch, the patient himself being virgin of syphilis.	Sexual contact with a chancroid; syphilis has nothing to do with either party.	Often spontaneous; sometimes follows unaccustomed sexual intercourse. Syphilis may be ignored in searching for a cause.
2. *Situation.*—Anywhere.	Most common in the fossa alongside of the frenum.	Usually subpreputial.
3. *Incubation.*—About three weeks.	About three days.	If due to intercourse, twenty-four hours to a few days.
4. *Origin.*—Papule.	Pustule.	Several clusters of vesicles.
5. *Type.*—Bloody excoriation.	Suppurating deep ulcer.	Irregular, superficial ulcer.
6. *Number.*—Unique.	Multiple.	Multiple.
7. *Physiognomy.*—Round, raw papule, or livid excoriation, or funnel-shaped ulcer. If an ulcer, the edges are adherent, the floor is pultaceous, the suppuration is scanty.	Round ulcer, with sharply cut, abrupt edges, often undermined, uneven pultaceous floor, suppurating abundantly.	Superficial ulcer, with thin borders plainly (at first) composed of a number of small ulcers which have run together.
8. *Auto-inoculation* fails.	Succeeds.	Fails.
9. *Course.*—Slow throughout.	Rapid, but gets well slowly.	Rapid, and gets well promptly.
10. *Pain.*—Absent.	Present.	Sharp, tingling sensation at first.
11. *Induration.*—Present.	Absent.	Absent.

These features are very clearly different in the different lesions. It takes more than one symptom to make a disease, and very few symptoms are absolutely constant in any disease. A typical chancroid ought to accord very closely to the description given above. When it is much complicated it may be quite wide of the mark. In such case its peculiarities may be found detailed in the more thorough diagnostic table, following the description of syphilitic chancre, at p. 97. In all cases of doubt, in every instance where the few broad distinctions clearly pointed out in this table fail to make the diagnosis certain, there is no safety in any course but delay. Delay will always make the diagnosis more certainly than any table. One mistake in the wrong direction, one condemnation of a healthy person to the years of distress of mind which he is sure to suffer if he supposes himself to be syphilitic—and all the more in some cases if no symptoms of the disease appear later to confirm his doubts—one such error more than counterbalances any possible good that might arrive in any number of cases by a few weeks' gain in the time of diagnosis between chancroid and syphilis.

Besides syphilitic chancre, there are other lesions liable to be mistaken for chancroid, but none of them commonly give any trouble to the close observer.

An abrasion acquired during sexual intercourse, and ulcerating subsequently, is sometimes suggestive of chancroid. Such an abrasion occurs

at the moment of contact, and, unless small, is usually shortly afterward recognized—perhaps by a drop of blood.

The edges of such an abrasion are generally jagged, and the base of the ulcer but little depressed, and discharging a thin sero-pus. But yet such an abrasion by neglect in debilitated persons, by lack of cleanliness, by inappropriate treatment (partial cauterizations with nitrate of silver), may acquire in time a physiognomy so nearly resembling that of chancroid that a diagnosis is almost impossible. Under these circumstances there remain the alternatives of auto-inoculation over the insertion of the deltoid, under the nipple or on the outer and upper part of the thigh; of delay, with the use of cleanliness, soothing and mildly stimulating local dressings, and tonics internally; or, finally, if the patient's state of mind calls for it, and the person from whom he acquired his sore cannot be found for inspection, no harm can come by adopting the conclusion that the suspicious ulcer may be a source of poison to others, and treating it as if it were a chancroid, by thorough destructive cauterization.

Should a patient present himself on the morning after suspicious intercourse with an abrasion still fresh upon him, what is to be done? It is manifestly an abrasion, and the patient has been exposed to any poison that may have been present in his partner. Several hours have passed, absorption has been accomplished; what is to be done? Very little except to make a reserved prognosis. Hill's case, Diday's experience, the results of the excisions of syphilitic chancres by Auspitz and Kölliker (p. 93), make it improper to promise any immunity from infection if true syphilis be dreaded; and if chancroid be feared, it is not of enough importance to justify a painful cauterization until the lesion has developed. Cleanliness, a little lead-water and a few days' time is all that a recent abrasion calls for. The same treatment also applies to herpes, but it is of advantage to make the lotion somewhat more stimulating than lead-water for herpetic cases. Thus, a simple treatment for a week or ten days becomes an important aid to diagnosis, capable of saving the patient subsequent distress and shielding the physician from blame.

The diagnosis between chancroid and an ulcerated syphilitic lesion situated under the prepuce sometimes gives trouble. An ulcerated mucous patch rarely exists unaccompanied by other lesions, through aid of which its nature may be defined. The pseudo-chancre, however, gives trouble. It is rare as a lesion clinically, and different ulcers have been described as pseudo-chancres by different observers. Fournier's pseudo-chancre of syphilitics—a secondary induration with ulceration often occurring at the seat of the primary lesion—is not likely to give any diagnostic trouble.

A spontaneous pustule may occur under the prepuce of a syphilitic patient without any suspicious contact, and ulcerating may resemble chancroid closely. This is a pseudo-chancre. An ulcerated gumma is quite apt to appear under the corona glandis, near the pocket of the frenum, late in syphilis. This ulcer resembles a chancroid, and is quite likely to eat into the urethra if not arrested by treatment. I have seen several instances of both of these sores, particularly the latter, mistaken for chancroid. The first resembles chancroid greatly; the latter not so closely, because its underlying base and border are quite hard, and its history shows that it started as an induration under the mucous membrane.

Finally, a pseudo-chancre may occur after suspicious intercourse, due to contagion with any pus, such as pus from an irritated syphilitic chancre, an ulcerated mucous patch, from vaginal discharges; and any of these kinds of pus may produce (as is well known), upon the body of a patient

already syphilitic, a suppurating sore much resembling, perhaps exactly like, a chancroid—but not a chancroid, as has been shown in Chapter II. Such a lesion is a pseudo-chancre.

Only two other lesions, so far as I am aware, have ever been called pseudo-chancre. These are the mixed chancre of Rollet (to be described later), and the result of inoculation of a true chancroid upon a syphilitic (Tarnowsky), from which latter a simple chancroid may be acquired by another through contagion, or, if the blood of the patient be admixed with the secretion inoculated, true syphilitic chancre as well. The name of pseudo-chancre ought not to be applied to these two lesions, since it leads to confusion, for the first is a compound ulcer possessed of both poisons, the last a simple chancroid upon a syphilitic patient.

The other three pseudo-chancres, however—(1) the spontaneous, not specific, non-indurated, sub-preputial ulcer of syphilitics, (2) the result of hetero-inoculation upon syphilitics in intercourse with syphilitic or indifferent pus, and (3) the ulcerated perforating gumma of the genitals—all of these pseudo-chancres are fertile sources of error in their diagnosis with chancroid.

They all occur upon patients already syphilitic; the pus of the first two may be auto-inoculable in generations—in each of them, especially the first and the last, there may be no other sign of syphilis present upon the individual. Often a diagnosis can only be made by a close study of the history of the patient, and prolonged attentive inspection of the lesion. The first two sometimes have the appearances of both chancre and chancroid, but the resemblance to chancroid is the more striking. The perforating gumma is often mistaken for chancroid, occasionally for lupus. A pseudo-chancre rarely looks like a true syphilitic chancre (Fournier's pseudo-chancre of course excepted), but it has certainly been sometimes described as such, and the patient, on its account, has been credited with two attacks of true syphilitics (p. 83.)

Hence, the practitioner may find himself in face of a pseudo-chancre, one of the three mentioned, and be unable to say whether it is a chancroid, or not. In such a case what is he to do? Perhaps the safest rule is this: cauterize thoroughly any pseudo-chancre which is auto-inoculable, and in case of any reasonable suspicion that the ulcer is a gumma, give iodide of potassium. The patient already has syphilis, and he is in no danger of harm from a little more anti-syphilitic treatment. The first two of the three ulcers under consideration will get well by local treatment alone, or by no treatment. They rarely, if ever, become phagedenic. The last ulcer, the perforating gumma, is another matter. This ulcer also gets well in the long run, spontaneously, but meantime it has destroyed tissue, perhaps eaten into the urethra, or made a ragged excavation in the head of the penis. Sympathetic suppurating bubo is rarely, if ever, found with pseudo-chancre, and least of all with this ulcerated gumma. The main hope of diagnosis is in studying the history of the sore and being familiar with its course and appearance. I have published elsewhere the record of a case * in which a tertiary destructive ulcer of the frenum had been cauterized by a gentleman in high authority, as chancroid, and where the malady, failing to get well, had finally been pronounced lupus, and extirpation with the knife gravely decided upon. The man recovered promptly under anti-syphilitic treatment.

Cauterization does not cure these cases, although they may improve

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[1] Case XLVIII.: Van Buren and Keyes. Op. cit., 1st ed., p. 537.

temporarily under the burning. More tissue is destroyed by the local treatment than can be spared, and valuable time lost which might have been employed in intelligent general treatment.

In only one form of the pseudo-chancre, then, can a mistake in diagnosis lead to any serious misfortune, namely, in the perforating gummy ulcer of the penis. A knowledge of this fact is the best safeguard against committing a serious error. The lesion, ulcerated gumma of the penis, is described in full on p. 164.

Certain chancroids are hidden from view. The urethral chancroid almost invariably involves the meatus, but possibly might be out of sight. A sub-preputial chancroid in case of phymosis, an anal chancroid resembling fissure—these and possibly other varieties cannot be diagnosticated in the usual way. In such case, when the suspicion of chancroid arises, the test of auto-inoculation is invaluable. If auto-inoculation produces a *characteristic chancroid* (especially if the patient be not syphilitic or cachectic) it may be positively predicated that the source of the inoculated pus was chancroid.

In auto-inoculation practised for purposes of diagnosis, six facts should be remembered:

(1). A gangrenous phagedenic chancroid loses its poisonous quality, just as decomposed chancroidal pus is no longer virulent, and auto-inoculation fails.

(2). Auto-inoculation of almost any pus, upon a patient already syphilitic, may take and produce an ulcer resembling chancroid.

It must be remembered that the source of such pus is not necessarily a chancroid.

(3). An ulcer may be a mixed chancre, in which case its auto-inoculation will take as a true chancroid; but the patient has syphilis none the less.

(4). Auto-inoculation of an irritated true syphilitic chancre may sometimes take as an ulcer resembling chancroid, and non-irritated true syphilitic chancre by auto-inoculation very exceptionally takes as a papule.

(5). A serpiginous phagedenic ulcer is auto-inoculable, but its auto-inoculation may produce a chancroid, which, in its turn, becomes phagedenic, since phagedæna is a property of the patient and not of the chancroidal virus he secretes. Hetero-inoculation of a phagedenic chancroid is no more apt to produce a phagedenic sore than is the hetero-inoculation of any other chancroidal pus. The deduction is, if auto-inoculation of a phagedenic sore be attempted, the site chosen for the puncture should be the breast under the nipple, since phagedæna rarely occurs here, and the ulcer should be at once destroyed as soon as it can be pronounced a take.

(6). In all cases of auto-inoculation destroy the little ulcer produced at the test-point as soon as it has served its purpose.

PROGNOSIS OF CHANCROID.

Uncomplicated chancroid gets well in a few weeks, and never leads to a result more serious than a trifling local scar. Chancroid of the most malignant type, attended by the most serious complications, never produces syphilis.

This one fact, that chancroid is not a blood disease and never produces syphilis, reduces all the damage it can do its bearer to such mischief as

any ulcer of similar extent and severity might equally well accomplish. In rare instances this damage is considerable. A severe and protracted chancroid of the rectum leads to stricture of that gut with all its distressing results; the mouth of the urethra may be nearly sealed up by the contracting cicatrix of a chancroid.

The minor possible results of deformity by eating into the urethra, and of phymosis by cicatricial contraction, must be remembered.

Erysipelas may attack a simple chancroid as well as any other lesion. The more extensive and complicated sores naturally lead to serious local consequences.

Phagedæna may stretch itself over large portions of the surface of the body, and last for years.

Sloughing phagedæna may destroy great segments of the penis, or so eat away its outer investment, that the resulting scar leaves the organ practically useless. A slough has been known to open a large vessel, and serious hæmorrhage as a complication thus becomes possible.

These extreme results are indeed possible, but they are so rare that they may be disregarded in giving an ordinary prognosis.

TREATMENT OF CHANCROID.

Preventive treatment.—A number of substances have been used experimentally to abort chancroids produced by auto-inoculation. Of late years but little has been done in this direction, and the text-book on syphilis written by Rollet[1] contains about all that is known on the subject. Preventive treatment is rarely, if ever, called for by the patient. In fact, the incubation period is so short that a patient has already a typical minute chancroid when he first discovers it, and when he seeks his physician the chancroid is perfectly formed and beyond the reach of prophylactic measures. The only preventive treatment to be recommended to a patient is that he avoid all sources of contagion; and the best preventive treatment of the spread of ulcers upon a patient by spontaneous auto-inoculation, is destruction of the poison at the source of contagion on his own person, by caustic, or the most absolute cleanliness, if total destruction be impossible. The abortive treatment can only be called for when the surgeon has contaminated a fissure on one of his own fingers in manipulating a patient with a poisonous discharge. Rollet states that all the strong mineral acids, some of the vegetable acids, the alkaline caustics, and certain salts, such as chromate of potash, sulphate of iron, diluted with water until they are too weak to attack the healthy epidermis, will cause a point of artificial inoculation to abort, if kept in contact with the surface for several hours and applied within a short period of the inoculation—three to six hours, occasionally as late as twelve to twenty-four hours. Rollet and Rodet think best of a concentrated solution of citric acid.

These means are very simple and easy of application. It is difficult to believe that absorption is so slow that anything could avail twenty-four or even six hours after inoculation. If this be true, it constitutes a difference between chancroid and syphilis greater than any yet advanced; for the rapidity of absorption of the virus of the latter, and inability of local treatment to abort it after it has once been applied, are well known.

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[1] Traité des maladies vénériennes.

Rollet's suggestions, then, may be tried; but practically, the surgeon can do better. If he fears inoculation at a fissure in his finger, he immediately plunges his finger into any water at hand (preferably containing carbolic acid), rinses it rapidly, dries it promptly upon a clean towel, and immediately places the suspected spot in his mouth and sucks it. The unabraded epithelium of the mouth is a bar to contagion should any virus survive the washing, and the comparative immunity of the face to chancroid is another safeguard from double contagion. After sucking for a moment and expectorating the saliva, the fissure should be touched with a ten per cent. solution of carbolic acid, which is slightly caustic, a strong solution of nitrate of silver, or even with chromic acid, and, if the precautions have been followed carefully, contagion will not occur at the accidentally inoculated point.

Radical treatment.—Chancroid owes its prolonged existence to the virulence of its pus. Destroy that virulence and the poisonous quality at once disappears, the ulcer becomes a simple traumatism, and the process of repair begins. Nature herself demonstrates this method of cure. Sometimes a chancroid inflames—a sub-preputial chancroid, for example. The tissues become tumid and congested around it, its circulation becomes strangulated, its surface sloughs. As soon as the slough has formed the pus ceases to be auto-inoculable (if the subject be reasonably healthy), and repair goes on at once with the throwing off of the dead tissues. *Any means, therefore, which will kill all the living tissues constituting the base of the ulcer and at the same time neutralize all the free poison upon the surface, will radically cure a chancroid.*

There are but two exceptions to this rule: (1). Unless a chancroid is very young, it is apt to return if cut out or cauterized. I have cut away a chancroid with half an inch of prepuce lying between it and the healthy parts, and yet that portion of the wound where the lymphatics were most abundant—the neighborhood of the frenum—became chancroidal. The most scrupulous attention to cleanliness was paid in this operation. (2). Some old chancroids certainly do not get well after the most extensive cauterization. This is notoriously true of serpiginous phagedenic sores. Each cauterization brightens them and they do better for a time, but the chancroidal features return to the ulcer and repair fails to follow the clearing away of the slough.

This is never the case with a young chancroid. Such an ulcer, cauterized thoroughly, ceases absolutely to exist as a chancroid.

The explanation to this is not, I think, so difficult as it seems at first glance. It is the poison, which must be destroyed to cure a chancroid by cauterization. This poison resides in the pus-corpuscle upon the surface of the sore, and is certainly also present in the base of the sore. In the young ulcer it is confined to these two localities, and a cauterization which includes the infiltrated tissues underlying the ulcer certainly destroys the virulence of the sore.

In an old chancroid, however, and especially in a creeping, phagedenic chancroid, the poison has infiltrated the tissues for a certain distance beyond the base of the ulcer, and cauterization does not destroy all the poison. It is eliminated from these tissues in course of nature by the white corpuscles, the wandering cells, which become possessed of it and wash it out at the ulcerated surface. If the ulcerated surface is destroyed, it becomes reinfected by poison brought from beneath; and for the same reason the wound of circumcision frequently becomes poisoned, when the prepuce is the seat of chancroid, in spite of such precautions as burning

the chancroid previously to the ablation of the foreskin, and perfect cleanliness during and after the operation.

Why it is that the poison in ordinary cases dies out after a few weeks, and is all eliminated with the pus, while in other cases of advancing phagedæna it seems able to perpetuate itself almost indefinitely, it is impossible to say, since we do not understand the nature of the poison. The probability is that the difference is solely a question of the soil in which the chancroidal poison finds itself, for phagedæna is a quality of the individual, and does not imply the inoculation of any special variety of chancroidal pus.

With the understanding, then, that in many old cases the chancroidal poison is widespread, and cannot be all reached by any means capable of totally destroying the ulcer, it is yet a uniform opinion among authorities that total destruction of the ulcer is the only certain cure of chancroid—and this is true without exception in all cases where the chancroid is young. At exactly what age chancroid ceases to be curable by the destruction of its surface, and a reasonable amount of tissue beyond, cannot be stated. Cauterization never does harm, and the rule is to cauterize a chancroid thoroughly as soon as its diagnosis is established, and to destroy all points of diagnostic auto-inoculation very promptly. This gives the best chance of speedy and permanent cure.

Potential caustics are most manageable as destructive agents, and therefore better than other means of destruction. Any surgeon may use his favorite caustic, acid or alkaline, but it must be a strong one. Acetic acid or carbolic acid will not do, and nitric and sulphuric acids fill all the requirements of any case. The chloride of zinc and other pastes pain more than the acids, and their application requires much more skill and care than the latter, that they may be applied thickly enough to destroy all the tissue required, and not left on so long as to destroy too much. The nitric and sulphuric acids meet the wants of all cases—the first to be used as a liquid, the second as a paste (carbo-sulphuric).

To prepare a chancroid for cauterization, all pus should be removed from it by holding pellets of absorbent cotton upon it, and the surrounding surface should be wiped as dry as possible. Upon the ulcer so prepared, a drop of pure carbolic acid is first placed, a little blotting or other bibulous paper being ready in the surgeon's hand to absorb any excess of acid that may escape out of the cup in the skin formed by the chancroid. The carbolic acid causes much less pain than pure nitric acid, and it benumbs the sensibility of the ulcer so that the application of nitric acid afterward is far less painful than it would otherwise have been, and none the less effective.

The drop of carbolic acid is absorbed out of the chancroid with bibulous paper, and the white, dry cup representing the chancroid is now ready for the final cauterization.

A glass rod, drawn to a point, is now dipped into fuming nitric acid, and enough acid placed upon the chancroid to fill its depression even with the surface. The bibulous paper is again used, if any excess of acid trickles over. This application is but slightly painful. The surrounding tissues are now held tense, and the little drop is watched. If the edges of the ulcer are undermined, the point of the glass rod should be moved around under the border beneath the surface of the drop of acid, so that all the recesses of the sore may be equally acted upon.

As the acid cauterizes the base of the ulcer, an areola of white color is seen to grow gradually around the sore under the epithelium. When

this areola gets to be as broad as a sheet of blotting-paper is thick, the cauterization is perfect. If it does not become so broad after watching it for two or three minutes, the drop of acid should be soaked out of the ulcer and a new one put in—and so on until the areola of white dead cauterized tissue reaches the required thickness. Then the sore is dried perfectly, covered with scraped lint or absorbent cotton, and left to itself. It is rarely necessary to alkalinize the surface; but this may be promptly done, if thought necessary, with a drop of liquor potassæ.

The white piece of tissue killed by the acid turns brown, then black. If its position is such that it may be exposed to the air, it is best to let it dry up and heal by scabbing, as it will sometimes do. Most chancroids, however, are sub-preputial. The little eschar begins shortly to slough off, a line of healthy suppuration forms around and beneath it. Absorbent cotton or moistened lint answer perfectly well as dressings to absorb the pus, or, if stimulation be needed, a good dressing, and one perfectly cleanly, is either of the following:

℞. Spts. rect..... ..... ʒ iss.—iij.
Aquæ..... q. s. ad ℥ i.
M.

Or—

℞. Chloral hydrat..... gr. i.—iij.
Aquæ..... ℥ i.
M.

In many cases a little vaseline or balsam of Peru, upon a piece of prepared lint, gives most satisfaction.

A small chancroid thoroughly burned ought to be well in ten days, more extensive sores require more time.

In case it is decided to cauterize a chancroid with an irregular base, overhanging edges, or pockets, where perhaps from the position of the sore the liquid acid cannot be evenly applied to the whole surface, the carbo-sulphuric paste meets the requirements of the case. This paste originated with Ricord, and is formed by mixing vegetable-charcoal dust with pure sulphuric acid until a black paste is formed. This is kept tightly corked in a bottle. It is applied with a flat piece of wood and pressed down into all the inequalities of the sore. The ulcer is filled up even with the surface, and the paste bound on and left to do its work of destruction. There is no danger that it will eat too deeply into the tissues. It chars the tissues before it, and the cauterizing action cannot penetrate beyond a safe depth.

But two cautions are to be given relative to the cauterization of uncomplicated chancroid in the usual positions.

(1). Never touch a chancroid with caustic unless each and every abrasion in the neighborhood, and all suppurating spots, can be totally and simultaneously destroyed. For if any chancroidal pus remains unneutralized it is ready to poison the healthy ulcer left by the separation of the slough, and to reconvert it into a chancroid. Thus, chancroid at the margin of the prepuce cannot be cauterized if sub-preputial chancroid also exists and is spared.

(2). In case of numerous sub-preputial chancroids, if the foreskin be naturally tight the reaction following cauterization may inflame the prepuce sufficiently to cause phymosis and conceal the cauterized spots from view. A fear of this occurrence need not deter the surgeon from a free

use of the cautery. The cavity of the prepuce can be kept syringed out, and if the cauterization has been effective the chancroids will certainly get well, even within an inflamed prepuce.

PALLIATIVE TREATMENT OF CHANCROID.

When all the chancroids cannot be reached, when the surfaces involved are quite extensive, the chancroids already a number of weeks old and not phagedenic, and in cases of certain regional chancroids, urethral, anal, rectal, at the margin of, or beneath a tight prepuce, cauterization is not generally applicable, and palliative treatment must be employed.

When all the chancroids cannot be reached, or are so large and old that cauterization is not justifiable, cleanliness is the first requisite of treatment. Frequent washings with warm water lightly carbolized (half of one per cent.), are to be recommended. The surfaces should be washed with a syringe, or by trickling warm water upon them, and dried by touching them with bibulous paper. Unquestionably the most efficient local application for these chancroids is iodoform, and its application pure, in powder or mixed into a paste with glycerine and scented with essential oils, is rarely painful. But respectable people will not use iodoform. Its peculiarly penetrating and tenacious odor is unmistakable. Those who have once smelled it upon any one else fear disclosure from the very fact of using it, and most of those who are unfamiliar with it at first, soon get to abhor it. In spite of all this it remains the most efficient local application for chancroids too old to burn, and by a careful person can be often so used as to escape all the disadvantage attaching to it.

Nothing will disguise the odor of iodoform. Oil of peppermint is perhaps the best of the aromatic oils for the purpose. Many other sweet-smelling oils have been used. These are combined with powdered iodoform in ointment with various greasy excipients, or the powder is rubbed into a paste with glycerine and then scented. The misfortune is that the odoriferous principle is more volatile than the iodoform, and, aided by the heat of the body, soon leaves the odor of the iodoform supreme. Applications of iodoform, dissolved in ether or chloroform, have been recommended. Their application is painful, the solvent evaporates, and the odor exhales as strongly from the fine dust left precipitated over the surface of the ulcer, as if it had been at first deposited there in its natural state.

Still, iodoform is too good a substance to be given up. Those who do not object to the odor can use it freely as a powder, or rubbed into a paste with glycerine. Others may use it undetected if their chancroids are sub-preputial and the prepuce reasonably long. The sores must be washed and dried. A little fine iodoform dust is then taken upon a narrow piece of card and scattered over the ulcerated surfaces. The prepuce must now be carefully pulled forward and a piece of absorbent cotton placed in its orifice. No portion of the iodoform must be allowed contact with the clothes or the fingers of the patient. He must be careful, upon urinating, to pull out the cotton gently, retract the prepuce only enough to disclose the meatus, and put in a fresh piece of cotton immediately. He must change his dressing frequently, at home, and use great care in his washings, not to let the water which has run over the sores touch any part of his person or of his clothing. By using such pre-

cautions, the most fastidious patient may employ this valuable remedy without betraying himself.

The effect of iodoform upon chancroids is very striking. It freshens up the surface wonderfully, and greatly shortens the duration of the sores. When it cannot be used, the choice of a local dressing lies between many soothing and gently stimulating applications. If the sores are subpreputial, and the prepuce loose, it is well always to pull back the foreskin, and, whatever dressing is employed, to interpose a film of moistened prepared lint, or dry bibulous paper, or absorbent cotton, in such position that it will lie between the sores and the healthy tissues, when the foreskin has been replaced.

When the discharge is not profuse, dry absorbent dressings alone may be used, or, in addition, the ulcers may be sprinkled with powdered oxide of zinc, or starch with a little calomel (gr. x. to ʒ i.), or bismuth and lycopodium in equal parts. The addition of a little camphor keeps the secretions sweet. The dressings must be changed often, and the sores frequently washed and dried. These remarks, be it understood, apply to chancroids which may not be burned, and where idoform is objectionable for any reason.

When the discharge of pus is considerable, rather stimulating, moist dressings are preferable, and lint slightly moistened with the fluid selected should be kept constantly applied to the surface of the ulcer. Any of the following lotions will serve:

℞. Zinci sulph. ..... gr. i.—iij.
Aquæ ..... ℥ i.
M.

Or—

℞. Potass. permanganatis ..... gr. i.—iij.
Aquæ ..... ℥ i.
M.

Or—

℞. Acid carbolic ..... gr. ij.—iij.
Aquæ ..... ℥ i.
M.

Or—

℞. Ferri et potass. tart. ..... gr. v.—xx.
Aquæ ..... ℥ i.
M.

Or—

℞. Vini aromatic ..... ʒ i.—iij.
Aquæ ..... q. s. ad ℥ i.
M.

With such applications and patience, all uncomplicated chancroids get well within a reasonable period. In using No. 2, 4 or 5 of the above, care must be taken by the patient not to soil his linen; the others leave no stain.

Internal medication is of no value in ordinary cases of chancroid. If the patient be manifestly debilitated, he should receive tonics and good food, and all functional derangements demand appropriate attention, but there is no internal specific for chancroid. Rest of body is sometimes desirable.

If the ulcers prove very sluggish, and need spurring on, it is useful to

make an occasional application, directly to the ulcerated surfaces, of bromine ʒ ij. to the ℥ i., or of pure carbolic acid, or of a saturated solution in water of permanganate of potash. A thorough going over with nitrate of silver will sometimes freshen the ulcers up; but time is the most efficient element in effecting a cure in all ulcers too old for rapid cure by thorough cauterization, or where destructive measures have been inapplicable from the first.

Anal and rectal chancroids are always obstinate and difficult to manage. The daily stretching of the parts by the fæces, and the difficulty of maintaining perfect cleanliness, are the main obstacles to cure.

Cauterization is inappropriate for ulcers in this region. Frequent washings with warm water containing chlorinated soda, and confinement to bed, with lavish use of iodoform powder upon all the ulcerated surfaces, is unquestionably the best treatment for recent chancroids in these regions. Constipation must be prevented. When the chancroid has lasted for years, and produced stricture of the rectum, extirpation with the knife, linear rectotomy, or lumbar-colotomy, may be required to effect a cure. (Bridge's case.)

Chancroids at the margin of the meatus urinarius may be cauterized unless they run too far down into the urethra. In such case iodoform plugs (a roll of lint covered with cerate and sprinkled with iodoform) will hasten cure. If the patient objects to this, he must wait long for nature to help him, for chancroids in this locality are very sluggish. Urethral chancroids are best let alone. They are very rare, and their ultimate effect is stricture of the urethra.

Sub-preputial chancroid implies a chancroid concealed by a prepuce, either congenitally tight, so that it cannot be retracted, or in a state of temporary phymosis from inflammation. The latter condition will be discussed under the head of Complications (p. 37).

When a chancroid is inside of a congenitally contracted foreskin, its presence can sometimes only be surmised. Generally a lump, tender on pressure, may be detected at one spot, however, or there may be several of them; and the auto-inoculability of the pus, and possible existence of chancroids at the margin of the prepuce, help to make the diagnosis.

In treating such chancroids, if the prepuce be not inflamed and in danger of strangulation, it is not necessary to use the knife. No extensive destruction of the parts within the prepuce is apt to occur unaccompanied by such external evidences of destructive inflammation as will naturally call for heroic interference.

Cleanliness is, if possible, more necessary in treating these chancroids than any others. A syringe with a long, flattened nozzle[1] should be used, its point inserted well down to the sulcus behind the corona, and into the pockets on either side of the frenum. Warm injections of the one-half of one per cent. solution of carbolic acid should be made frequently enough to keep the pus from accumulating. Ricord praises the occasional injection of a gr. v.—xv. solution of nitrate of silver. Iodoform shaken up with balsam of Peru may be injected into the depths of the preputial cavity with a syringe. Generally, these chancroids are slow, and cleanliness, with time, the only real elements in the cure.

Chancroids of the margin of the prepuce, there being no ulcers within, if they can be thoroughly exposed, should be cauterized.

Chancroids undermining the frenum call for a division of the frenum,

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[1] Such a syringe has been devised by Dr. R. W. Taylor, of New York.

to hasten their cure and avert the possibility of bleeding, should the frenum get accidentally ruptured or eaten through by ulceration. This is best accomplished by tying a stout silken ligature around it, and cutting the ligature short. The ligature cuts its own way through very promptly, and then the open chancroid may be treated more satisfactorily.

Chancroids of the vulva and vagina call for especial care. Cauterization, if applied, must be done with great accuracy and thoroughness, with the parts fully exposed. The speculum must always be used, and the whole of the interior of the vagina inspected for other ulcers, or cauterization of the chancroid of the fourchette, or elsewhere, is apt to be ineffective. Young chancroids anywhere about the female genitals (except at the orifice of the urethra) may be successfully cauterized; old ones are best treated with cleanliness, disinfectant injections, rest, and iodoform. Iodoform may be easily so managed upon a female as not to be offensive in odor. Follicular chancroids on the labia majora, at the roots of the hairs, are not very unusual in woman. They look like boils at first. They should never be poulticed, but opened very early, and cauterized thoroughly.

The external genitals in the female sometimes become greatly hypertrophied from the prolonged presence of chancroids at the ostium vaginæ. Treatment of the hypertrophy is useless until the chancroids are cured, after which it usually slowly subsides spontaneously. Traces of it may remain almost indefinitely.

Chancroid of the fingers.—When the surgeon or accoucheur gets a chancroid upon the finger, it should be thoroughly cauterized, and then splinted, and kept covered up from dust and exposure to air. A chancroid on a knuckle is sometimes as hard to cure as a chancroid of the anus or at the meatus urinarius, the reason being that the incessant injury done by motion of the part keeps the ulcer alive. An ordinary abrasion will sometimes ulcerate, and last for weeks upon a knuckle. I have known one such abrasion to be diagnosticated as a syphilitic chancre, and the patient kept miserable for years, fearing syphilitic eruptions which never came. A splint putting the knuckle at rest is all the special treatment that is required in these cases.

CHAPTER IV.

CHANCROID.

THE COMPLICATIONS OF CHANCROID, AND THEIR TREATMENT.

Chancroid complicated by Inflammation.—Inflammatory Phymosis and Paraphymosis, with their Treatment.—Phagedæna, Sloughing and Serpiginous, and its Treatment.—Chancroid complicated by Syphilis.—The Lymphangitis of Chancroid, Inflammatory and Virulent, and its Treatment.—The Bubo of Chancroid, Simple, Indolent, Spontaneous (Bubon d'Emblée).—Treatment of Simple Bubo.—Treatment of Indolent Bubo.—Virulent Bubo, or Subcutaneous Chancroid.—Treatment of Virulent Bubo.

CHANCROID may be complicated by inflammation, phagedæna, syphilis, lymphangitis, and bubo.

Chancroid complicated by inflammation.—An ulcer doubtless cannot exist without some inflammation, but a typical chancroid is attended by so little of this process that, practically, inflammation does not exist; certainly there is no pain, heat, redness, swelling, or interference with function worthy of being taken into account. Most chancroids, however, as encountered clinically, are inflamed in a measure, and possess all the five qualities of inflammation to a greater or less extent. This amount of inflammation does not constitute a complication.

When a chancroid inflames from mechanical or chemical irritation, or from the habits of the patient (drinking, debility), its base hardens, its discharge grows thinner and sanious, pain is complained of, and generally the course of the sore is prolonged, the surrounding tissues becoming œdematous and indurated, and the ulcer finally pale, flabby, unhealthy, going on to a slow cicatrization. Simple (non-virulent) bubo is very much more apt to occur with an inflamed chancroid than with a typical ulcer.

When inflammation complicates sub-preputial chancroid, the tissues of the prepuce become much distended with serum, and sometimes very hard and rigid from stiffening of the connective tissue by inflammatory exudation. A superficial lymphangitis is the cause of these phenomena; the larger lymphatic vessels may escape entirely. This lymphangitis is not an erysipelas, although it greatly resembles it. It is not an uncommon complication of chancroid, while true erysipelas is a rare one.

Inflammatory phymosis or paraphymosis, under these circumstances, often ensue. If the chancroid occupies the inner surface of the prepuce, it is in danger of strangulation among the inflamed tissues, and may fall into total gangrene, a large portion of the prepuce, with the chancroid, sloughing away, and allowing the glans penis to protrude through the opening, making a sort of double-headed penis. The remains of the prepuce in such cases long continue thickened and indurated, and require to be trimmed away finally, when cicatrization is complete.

This result of inflammation is not a serious one, since the sloughing

process kills the chancroid outright and repair commences with the separation of the slough, just as it does after effective cauterization.

A more disastrous result of inflammatory phymosis is the possibility of many new points of auto-inoculation within the cavity of the prepuce, the retained poisonous pus excoriating the surface of the glans penis and perhaps inoculating the meatus. Portions of the new chancroids may then slough, and considerable loss of the glans penis ensue, with stricture of the meatus from cicatrization. The liability of causing bubo by allowing an inflamed prepuce over a chancroid to remain long unrelieved is to be borne in mind, and the possibility of extensive denudation of the penis by the backward burrowing of the retained chancroidal pus has been clinically proved (Vidal).

Inflammatory paraphymosis may complicate a chancroid when the prepuce is short. The swelling encircling the penis may become so great that the circulation of that portion of the penis lying in front of the constriction is menaced.

The treatment of inflammatory complications of chancroid is obvious. Rest must be insisted upon, the penis elevated and covered with moist, cooling, evaporating lotions, or with astringent solutions. Among the former, one of the best is:

℞. Glycerinæ..... ♏xx.
Spts. rect..... ʒ i.—ij.
Liquor. plumbi sub-acetat. dil..... q. s. ad ℥ i.
M.

It is to be kept constantly applied cold upon a thin cloth on the outside of the penis.

Solutions of tannin act exceedingly well as astringents in some conditions of œdema of the penis. The main objection to it is that it stains white fabrics. From gr. x.—xx. in ℥ i. of water is strong enough. It must be constantly applied fresh, and the penis kept well elevated.

These applications are palliative. The treatment of the chancroid, meantime, goes on by sub-preputial injections, idoform applications, or whatever it may be. If the sub-preputial discharge of pus gains in quantity, if the inflammation fails to yield and gangrene is to be feared, then but one course is left, namely: to slit open the cavity of the prepuce, cut away the redundant tissue, circumcising the patient, and dress unsparingly with iodoform. Cauterization in these cases will not prevent the wound from becoming inoculated, and only prolongs the duration of the sore.

In cases of paraphymosis the line of stricture of the prepuce must be divided with the knife as soon as the circulation of the penis in front of it is threatened. If the circulation continues perfect it is better in most cases not to attempt to reduce the paraphymosis, since the latter insures the advantage of leaving the ulcers exposed to view. A patient with paraphymosis is generally confined to bed, and the odor of iodoform ceases to be an objection to its use.

Chancroid complicated by phagedæna.—This is the most formidable of all the local complications of chancroid. Phagedæna occurs in two forms: (1), sloughing phagedæna; (2), serpiginous phagedæna. The predisposing general causes of phagedæna are not fully known. It sometimes attacks a florid, healthy-looking youth, and often spares a cadaverous consumptive, or a patient debilitated by excesses of all sorts. It is a

rare complication. Phagedæna is not confined to chancroids. Any ulcer—syphilitic, scrofulous, or simple—may be attacked by it. Phagedæna is a peculiar quality of the individual. The pus from a phagedenic ulcer will not produce phagedæna by hetero-inoculation. This has been abundantly proved by Fournier's confrontations, Sperino's syphilization, the inoculations of Salneuve, Rollet, and others. Conversely, it is known that a simple chancroid produced upon a patient with phagedæna is liable also to become phagedenic, showing clearly that the phagedenic quality is a personal one.

Among the presumed predisposing causes of phagedæna have been grouped all depressing dietetic, hygienic, diathetic and pathological conditions—old age, misery, alcoholism, scrofula, malaria, digestive troubles—but not one of these can be proved efficient even in a majority of cases. As local causes, lack of cleanliness and mercurial ointment (Ricord) have been accredited with a fair share of the blame in the production of phagedæna, but probably without good ground for the accusation. It is probable that phagedæna is a personal idiosyncrasy, perhaps allied to the scrofulous diathesis (but independent of it), not existing continuously in a given patient, and aggravated by those causes which have generally been considered capable of generating it. No other explanation than this covers the cases of bright-eyed, rosy-cheeked, fat, hearty boys, with good appetites, strong physical powers, and in the healthy performance of their functions—with phagedæna. I have encountered several cases of this sort. On the other hand, who has not met with broken-down patients with syphilis, consumption, cancer, malaria, fever, cachexia, old age, dyspepsia, whose chancroids belong to the simplest possible type and run their course mildly in a reasonable time.

Sloughing phagedæna.—When a chancroid is attacked by sloughing phagedæna the tissues beneath it swell up and become livid for a distance around. The pus gets scanty and sanious. The ulcer grows larger and dryer; a slough, gray, brown, black, promptly forms upon it; the part becomes excessively painful; the slough separates promptly, or slowly, according to its thickness; and then comes a lull in the process.

After a rest of longer or shorter duration a new attack of pain announces the commencing formation of a new slough, and the process repeats itself. Large excavations in the tissues are thus caused, for sloughing phagedæna spares nothing. It does not dissect out the vessels or arrest itself at a barrier formed by a new tissue. Fortunately, it generally remains superficial and advances on one side while it gets well on the other.

This is not always the case. It may sweep away the penis in the male, destroy the labia and perineum in the female, make the most extensive ravages before its fury is appeased. It has been compared to hospital gangrene, which it much resembles. It may even endanger life by exciting peritonitis when ulcerating deeply over the abdomen, or giving rise to profuse hæmorrhage by cutting through a blood-vessel. It may wear out the sufferer by pain, fever, exhausting diarrhœa, and debilitating sweats.

The poisonous chancroidal quality of these ulcers remains as tested by inoculation, yet the poisoned surface seems to grow tolerant of the virus after a time, and one side of the great ulcer will be cicatrizing, while a fresh slough is forming on its opposite border.

Serpiginous (creeping) phagedæna.—This form of phagedæna is milder in all respects than the sloughing variety, but, in revenge, it is more chronic. The former exhausts itself, yields to treatment, or kills the pa-

tient within a reasonable period, while creeping phagedæna seems to have little or no reaction upon the general health, is not attended by much pain or any fever, and yet continues sometimes almost indefinitely. The longest duration for a phagedenic chancroid yet recorded is fourteen years. This case is reported by Fournier, the phagedæna commenced in a virulent bubo at the groin, and was still open at the knee when reported by Fournier several years ago. Its duration was not due to bad treatment, for Ricord had had the patient under his care for several years.

The nature of the creeping phagedæna is not known any more than that of sloughing phagedæna. All that can be said is, that it is not transmitted by hetero-inoculation, and generally occurs upon the debilitated. The lower orders of society furnish most of the cases for hospitals. Among the upper classes it is seldom seen, except in its mildest form, which consists simply in an unusual spread in the area of the ulcer, some deviation from the rounded shape, and a certain prolongation of the duration of the sore.

Serpiginous phagedæna commences as a swelling at the borders of the chancroid, which become more red than usual. Some headache may be complained of, and a burning sensation at the advancing edge of the ulcer. The connective tissue falls into molecular gangrene more readily than the fibrous felting of the cutis vera, and, as a consequence, the borders of the ulcer become largely undermined. The remaining bridges and their flaps of livid skin, perforated here and there where the ulcerative action has eaten through to the surface, make pockets and sinuses around the ulcer, some of which extend to long distances. In this manner all the integument of the penis may be dissected up, large pouches run down the thigh and around the crest of the ilium, or (more rarely) up over the abdomen.

As one side of the ulcer advances the other generally heals, and thus the ulcer creeps for months, perhaps for years, over the surface. The base of the sore retains its chancroidal character. It is uneven, gray, covered with adherent, pultaceous secretions, and occasional prominent, flabby granulations bleeding at the slightest touch. The discharge is watery, bloody, usually free, occasionally scanty, but still auto-inoculable.

Periods of rest of greater or less length occur during the progress of phagedæna, when the ulcer remains stationary, or even, perhaps, seems to be healing all around; and then, without apparent cause, the phagedenic action will commence again at one border, while cicatrization goes slowly on undisturbed at the other.

Phagedæna once seen cannot afterward be confounded with anything else. Its attacks are not limited to chancroid, but are also seen in the serpiginous ulcerative scrofulide or syphilide. In any case of doubt, diagnosis must rest upon the history of the origin of the process (in a chancroid or virulent bubo), and upon the auto-inoculability of the pus.

The bubo attending phagedenic chancroid may be a simple one, or may be virulent, and itself take on phagedenic action. Phagedæna seldom, if ever, attacks simple inflammatory bubo.

Serpiginous phagedæna never gets beneath the deep fascia; a change of tissue will often stop it, and it will dissect out nerves and vessels, leaving them exposed in the wound; it is generally arrested at mucous membranes. Unless commencing in the vagina, it rarely enters it, and does not enter the rectum from without. In both of these localities, especially the vagina, it may thrive and last for years; but in these cases it has originated in a chancroid, upon the mucous surface, and has not commenced outside,

—as phagedæna in a bubo, for instance,—and worked its way from the integument into the vagina.

Treatment of phagedæna.—All possible improvement in the hygienic surroundings of a patient, a generous and varied diet, and internal tonic measures, are of value in treating phagedæna. Cod-liver oil, if it can be digested, quinine in large doses, especially in the depressing fever of sloughing phagedæna, and iron, are excellent remedies. Custom has sanctioned the preference of Ricord's tartrate of iron and potash, in ten to twenty grain doses in solution, as a tonic in phagedæna. Ricord thought it was nearly a specific, and some cases certainly do well upon it.

The internal treatment of phagedæna by opium will sometimes succeed, especially in old cases of serpiginous sore, where there is more pain than usual. Some surgeons place much reliance upon opium in all conditions of chronic ulcer. Rodet reports cases of serpiginous chancroids, which got well under opium, after other means had failed. The solid opium (or an extract) is given in small and repeated doses, gradually increased as the patient acquires tolerance, and pushed to the point of keeping him slightly narcotized all the time. If good effect is to follow, it commences within a week or ten days. The objections to the treatment are the constipation it occasions, to be met by the use of appropriate laxatives given with the opium, and the possible danger of establishing the opium-habit.

The local treatment is more important than general measures. It must be remembered that a chancroid never commences phagedenic. It exists as a chancroid for a varying time, and then takes on phagedæna. A chancroid by auto-inoculation upon a person with phagedæna acts in this way, and the advantage of early and thorough destruction of all chancroids becomes on this account very evident.

Both forms of phagedæna require the same local treatment. They should be managed like cases of hospital gangrene. Total destruction of all the tissues involved, and extending widely beyond the immediate area of disease, is certainly the best treatment. This cauterization must be a severe one. It will not destroy more tissue than the ulcer left to itself would have eaten away, and an imperfect cauterization will do more harm than good.

Ether should always be administered in these cases. The ulcer must first be ready for cauterization. All overhanging bridges and flaps of undermined livid integument must be cut away. It is best to do this with scissors, and to sear the bleeding edges at once with a thermo-cautery (such as Paquelin's). When all sinuses have been laid open, and the whole ulcer is flat and exposed and the bleeding arrested, then the surface should be washed with a solution of carbolic acid, and dried with bibulous paper. Next, it should be touched all over with pure carbolic acid. This whitens the surface, but leaves it soft, and it may be dried, and left quite clean and white, ready for the final cauterization.

Nitric acid cannot be depended upon in burning these extensive ulcers. A certain depth beneath the ulcer must be destroyed in all directions, in order that the cauterization may prove effective. As the floor of the ulcer is uneven, a liquid caustic cannot be applied uniformly over the whole surface; it will spare the elevations, and spend its force upon the depressions. There is no reason why, if accurately applied, nitric acid should not serve as well here as any caustic; but the difficulty is mechanical, and other caustics are better.

The choice of caustic lies between actual cautery and a caustic paste.

Hot irons do not cauterize well, because they give up their heat very promptly, and, therefore, cauterize unevenly. The electro-cautery is better, or the naphtha cautery of Paquelin, because the cautery point can be kept uniformly hot throughout the entire sitting, no matter how prolonged the latter may be. By the use of these means, employed with the utmost deliberation and care, if the entire base and the surrounding integument for one-fourth of an inch can be absolutely charred by the cautery, nothing more can be asked, and a cure of the phagedæna may be confidently expected.

Unfortunately, but few phagedenic sores are sufficiently small, or so situated as to be certainly totally destroyed in this manner without endangering surrounding parts. In such case, if the ulcer is suitable for cauterization at all, a caustic paste should be employed. Either the chloride of zinc, or the carbo-sulphuric paste may be used—preferably the former, freshly prepared, by mixing equal parts of chloride of zinc and dried flour, with a few drops of alcohol, into a paste. This is to be packed and crowded into all the uneven crevices and irregularities of the surface already prepared, as directed above, and thoroughly dried out. The packing is done with a small wooden spatula, and the excavation of the ulcer filled in even with the surface of the surrounding integument at the edges, but not laid on thicker at any one spot than one-eighth of an inch, since this thickness is ample. The packing is now accurately covered with a piece of prepared lint cut to fit, the surrounding epidermis is greased with vaseline freely, then the whole surface is generously dusted with powdered starch or lycopodium, covered with a thick layer of absorbent cotton, the whole retained by a snug roller-bandage.

Morphine may be required to control pain. The bandages should be removed in from twelve to twenty-four hours, the surface washed, and dried with absorbent cotton, and finally dressed with a mildly carbolized water dressing, or any other simple application.

Bromine has been suggested for these ulcers, and a saturated solution of permanganate of potash, but neither of these means have been generally enough employed to justify a conclusion as to their exact value. The methods above detailed are certainly efficient where cauterization is justifiable.

There are many cases of bad phagedæna in which cauterization should not be attempted. In any case, when the whole surface cannot be laid bare and included in one cauterization, other means must be used. This exception covers many cases of vaginal and rectal phagedæna—cases in which such extensive layers of integument have been dissected up, that it becomes unsurgical to remove them, *e. g.*, when the integument of the penis is very much undermined, cases in which long sinuses exist involving too extensive destruction of tissue. Finally, cauterization is not applicable when there is danger that the caustic may do harm by eating in too deeply; on this account, extensive and deep phagedæna over the femoral vessels, which would stay the hand of the operator through fear of going too deeply, is not a proper case for caustic. Finally, if thorough cauterization has once failed, it is better to try other means before resorting to it again, and under these circumstances the occasional application of the lighter caustics, carbolic acid, bromine, saturated solution of permanganate of potash, have a place, and doubtless will freshen up the surface and help to cure in many cases where thorough cauterization cannot be applied, or has failed.

Where cauterization is not applicable, pure powdered iodoform is

incomparably the best local application. The ulcer should be covered with iodoform dust, which is to be renewed as often as the discharges wash it away. This, with disinfecting washes of weak carbolic acid or weak chlorinated soda-water, is an excellent resource, and often acts like a charm. Ricord's old favorite as a local application, gr. xx.—xl. solution of tartrate of iron and potash, must not be forgotten.

An attack of ordinary erysipelas passing over a phagedenic chancroid sometimes cures it entirely.

The method of treating phagedenic, syphilitic, and other unhealthy sores, by intermitted or continuous submersion in water, has been revived of late, and brought into prominence through the publication, by Mr. Arthur Cooper,[1] of some exceptionally good results obtained by its use in the Lock Hospital, upon patients under the care of Mr. Alfred Cooper and of Mr. Milner.

This treatment is not at all new. The names of Hebra in Germany, Hutchinson in England, and Hemard in France, are well known in connection with it; but the supposed difficulty in carrying out the process, a lack of widespread conviction in its superior value, and the fact that text-books do not commonly advise this form of treatment, have kept it out of general use, and prevented it from being tested on a large scale. It is time that this apathy, regarding what promises to be an excellent method, should come to an end. The reliable results which have been published certainly render the method worthy of trial in all severe cases of phagedæna, whether attacking chancroid, chancroidal bubo, or a syphilitic sore.

The method of submersion employed by Mr. Cooper is simple and easy to carry out, while its effectiveness can hardly be doubted after reading the report of the cases in which it was used. Briefly, the method is as follows:

The patient is made to sit in a hip-bath, or other convenient bath, so that the site of the ulcer may be entirely submerged for from eight to ten hours a day. The water is kept as nearly as possible at a uniform temperature of 98° F. A blanket over the shoulders, and another (or a rubber air-cushion) between the buttocks and back and the cold tub, complete the apparatus. Here the patient quietly remains all day. In the evening finely powdered iodoform or other suitable dressing is put upon the sore, and the patient goes to bed.

On the following morning the patient enters his bath without disturbing the dressing of his local ulcer. The water of the bath thoroughly soaks these dressings and removes them without pain.

A purge before the course of baths, and a continuance of tonics, and any appropriate internal medication during their use, is recommended.

Cooper's paper reports thirty-one cases. Of these, twenty-two were sloughing or phagedenic ulcers of the penis, which had been in existence from a few days to several weeks before treatment was commenced. The remaining sores were phagedenic, tertiary syphilitic, and gangrenous lesions, involving the genitals or their neighborhood. In none of the cases was the bath used longer than twelve days; in most of them the ulcer is reported to have become healthy in from two to six days. Some excellent cases are detailed, showing the rapidly favorable influence of the submersion.

Three cases of the "slowly spreading non-inflammatory form of phage-

[1] London Lancet, May 24, 1879, p. 731.

dæna" are reported by Mr. Cooper as having relapsed after a discontinuance of the baths. The writer believes that this was due to too short a continuance of the submersion treatment.

Only three failures were reported: one refused to continue the bath after nine days; number two was too fat to sit comfortably in the bath; in number three, the bath aggravated the pain of an extensive tertiary ulcer; usually pain is relieved by the bath.

If the sore is sub-preputial, circumcision should be performed. It is stated that the wound "scarcely ever takes on the diseased action." The bath should be continued at least a day after the wound looks quite healthy, and continuous submersion, as recommended by Hutchinson, tried when intermittent treatment fails.

Chancroid complicated by syphilis.—Chancroid is not said to be complicated by syphilis when a patient with syphilis gets chancroid. The term is applied only to the mixed chancre, where both poisons exist at one and the same time in the local sore. This ulcer will be described at p. 87. The previous existence of syphilis in a patient does not at all modify the appearance or course of chancroid.

THE LYMPHANGITIS OF CHANCROID.

About two-thirds of all chancroids remain purely local; the other third is attended by bubo, which latter may be inflammatory and resolve, or suppurate, or be virulent. What proportion of chancroids is attended by lymphangitis is not known, but it certainly is less than one-third. The lymphatic trunks rarely become implicated without simultaneous bubo, while bubo frequently occurs when there is no lymphangitis.

Lymphangitis attending chancroid is of two varieties: inflammatory and virulent.

Inflammatory lymphangitis.—In this affection, one or more of the lymphatic trunks upon the back or sides of the penis becomes thickened, mainly by inflammation of the connective tissue surrounding the vessel. A hard cord is felt under the skin, with perhaps several knotty swellings along its course, usually sensitive to pressure, sometimes adherent to the skin, varying in size from a goose-quill to a broad band, according to the extent of the surrounding inflammation, sometimes marked upon the surface by a red line. This hard cord may extend from the chancroid a certain distance, or may be traced to the root of the penis. Sometimes it is found only toward the root of the penis, being absent in front. If the superficial lymphatics are also involved, the skin may become œdematous, erysipelatous, hot, and tender. If the hard cords are sufficiently tender, erection puts them upon the stretch and causes pain. If the inflammatory symptoms run high, there is a corresponding amount of general reaction in the way of fever, etc.

The terminations of inflammatory lymphangitis are by resolution and suppuration. The pus of the latter is always simple, non-virulent, and is due to excess of inflammatory action. The little abscess generally heals promptly, and the lymphangitis always gets well.

Virulent lymphangitis is very rare. It possesses all the foregoing symptoms in a high degree, and goes on promptly and necessarily to suppuration at one or more of the knotty points along the inflamed cord. The pus discharged is auto-inoculable, and yields chancroid. The ab-

scesses at the suppurating points do not heal, but become chancroids, and require to be treated as chancroids.

Treatment.—Mild cases require no special care. If pain and surface redness run high, a cool, evaporating lotion (p. 38) is appropriate, the patient remaining in bed with the penis elevated, and not hanging down between the thighs. Poultices are objectionable, since they soften the epidermis, and tend to increase the size of the resulting chancroid, should suppuration ensue and prove virulent. Abscesses should be opened promptly, and dressed dry with absorbent cotton, frequently changed. They get well shortly if the suppuration be innocent; if virulent, they are chancroids, and must be treated as such.

THE BUBO OF CHANCROID.

The term bubo is no longer confined to inguinal swellings, but is applied indifferently to the enlargement of any lymphatic gland in the body when the immediate cause is a recent venereal ulcer, chancroidal or syphilitic.

All authors and statisticians agree that bubo occurs with chancroid, not oftener than once in three cases. It is more common in men than in women, and the strumous and lymphatic are especially prone to it. The inflammation is confined to the ganglia of the superficial chain, the deep glands always escape, the glands nearest the ulcer are most often involved. There are two varieties of bubo: the simple, and the virulent. No statistics show their relative frequency; but it is probable that, if only those buboes which actually suppurate are considered, the number of virulent buboes will be found fully as great as that of the simple suppurating variety.

Bubo usually occurs in the groin corresponding to the side of the penis involved by the chancroid; but it may be in the other groin, when it is called a crossed bubo; or double bubo may occur with a single sore. Only one group of glands is involved in suppuration.

Bubo is sometimes peri-glandular, the gland itself escaping. When a chancroid inflames, simple bubo is a little more apt to occur than with the typical uninflamed sore.

Simple bubo.—This is the so-called sympathetic bubo. It is due to the presence of irritation along the line of the lymphatic radicals belonging to the gland involved. Simple bubo may occur spontaneously from a strain, or without known exciting cause, in a lymphatic person. It is found sometimes complicating gonorrhœa, or attending ulcerated herpes. It may even occur in connection with an irritated syphilitic chancre. Any sore of any character may give rise to it in a subject who is predisposed, especially if he be run down physically at the time; but chancroid is the most common cause.

Simple bubo generally occurs early, if at all, commencing within a week or two after the chancroid is fairly under way; yet, it may occur when the ulcer has nearly run its course. The immediate determining causes are often fatigue, excess, mechanical injury to the gland; but chancroid alone may cause it without the assistance of any of these additional provocations.

Generally, only one gland is affected, or one gland so much more prominently than the others that the latter may be disregarded. Exceptionally, several glands suppurate.

The symptoms of simple inflammation of a lymphatic gland are at first a sense of stiffness in the groin and a slight swelling of a single gland. The gland rolls under the skin, is sensitive to pressure, and the seat of pain upon standing, walking, and particularly upon going upstairs. As the gland increases in size, the pain proportionately increases. The skin finally adheres and becomes reddened. Then it becomes œdematous, and a central soft spot appears, indicating suppuration. Occasionally the peri-glandular tissue suppurates, the gland itself undergoing resolution. Left to itself, the abscess opens, discharges for a varying period, according to the general condition of the patient and the amount of rest he allows the sore. Much exercise always interferes with rapid repair, on account of the position of the ulcer. Occasionally the pus burrows in various directions beneath the skin.

This is the typical inflammatory bubo. Its course may be arrested spontaneously, or by treatment at any period, even after suppuration has been established. Simple pus in a bubo may be absorbed. The amount of fever or general systemic disturbance is considerable in some cases, absent in others. Suppuration may be announced by chill. Finally, simple bubo may be complicated by gangrene or by erysipelas, but, apparently, not by phagedæna.

Indolent bubo is a sub-variety of simple bubo. Patients with this form of bubo are generally lymphatic or strumous in constitution. The bubo is often double, a number of lymphatic glands being involved on each side. These glands grow rather slowly, and become matted together by inflammatory changes in the surrounding atmosphere of connective tissue. The compound tumor may reach the size of an egg or a small orange, be attended by but little pain, and perhaps no appreciable systemic disturbance. The adherent integument over the lump is thin, livid, sometimes shining, usually of a dead hue, sometimes smooth, sometimes œdematous and lying in welts over the glands along the folds of the groin. The pressure of the tumors may so interfere with the return circulation from the penis and scrotum that the latter become enormously œdematous in a passive way. Generally the penis and scrotum are not altered.

This livid, chronic enlargement in the groin may continue for weeks, possibly for months unchanged, occasioning very little annoyance. Sometimes, on the other hand, it is attended by considerable pain. The chancroid may have healed up long before any change has occurred in the buboes—sometimes even before they have reached their full development.

The course of indolent bubo is variable. Sometimes it undergoes gradual resolution without any breakage of the skin, occasionally after small foci of suppuration beneath the skin have given evidence of their existence by fluctuation. Generally, peri-glandular suppuration occurs, and one or more small perforations of the thinned and livid integument occur, allowing exit to a small amount of sanious watery fluid containing a few pus-corpuscles. Discharge from these openings continues, but the glands do not break down. The pus burrows in different directions slowly under the skin, and at the bottom of long sinuses other little livid abscesses may form and open spontaneously, leaving rigid fistulæ to discharge interminably. The openings in the skin may enlarge, and a gland covered with pale, unhealthy granulations protrude.

This condition of things may last for months, even years. The pus of such a bubo is never auto-inoculable if the patient be even reasonably healthy. The indolent bubo may occur independently of chancroid in all respects, and follow the above detailed course accurately. There is an

indolent bubo of syphilis similar, in many respects, to the one just described, excepting that it does not often suppurate. Treatment of indolent bubo, p. 49.)

The spontaneous bubo or bubo without a sore, is a simple bubo arising from a strain, fatigue, struma, cachexia, local injury. It has nothing to do with syphilis, and no connection with chancroid, and does not imply either of the latter diseases any more than does a suppurating gland in the neck. Much was formerly written of this *bubon d'Emblée*, especially as a supposed evidence of the existence of syphilis without a sore.

Less will be heard of it in the future. Its claims to recognition as a venereal malady have been entirely overthrown, and its accidental position in the groin alone gives it interest and respectability, more than attaches to the same identical lesion when it occurs spontaneously in the axilla.

A form of spontaneous bubo has been described furnishing auto-inoculable pus, and not accompanying a chancroid. Such a bubo must exist upon a cachectic or syphilitic person, whose skin may be induced to ulcerate by the application of non-virulent pus—or a chancroid must have existed, as a cause, and have cicatrized, or have been overlooked. It may have been in the rectum and not have been sought after at all. In any case the bubon d'Emblée of the present day is not considered to be either chancroidal or syphilitic. It is a spontaneous, simple, inflammatory bubo.

Treatment of simple bubo.—Simple bubo may often be aborted. The moment a trifling stiffness in the groin begins to be felt, and a single gland is found, by pressure, to be the sensitive spot, the greatest amount of rest possible should be insisted upon. Rest in bed is most desirable, but patients will rarely consent to it. In any case the patient should keep off his feet as much as possible. The diet should be moderated in conformity to the rest enjoined, not for any so-called antiphlogistic reason. Stimulants should be avoided. A laxative may be required. The chancroid should be cauterized at once, if it is a sore suitable for that treatment. In this way its poisonous quality is best allayed, and the bubo perhaps saved from becoming virulent.

If the patient is full-blooded, a dose of bitter water or of salts,[1] every morning, will probably serve as well as leeches—the objection to the latter being that their bites sometimes fail to heal, and all become inoculated should the bubo prove virulent. The same objection must be urged against all the strong counter-irritants and vesicants used to abort bubo. They are not of service unless they take off the cuticle. If they do this, and the bubo, proving virulent, suppurates promptly, the resulting chancroid is much larger than it need be. The risk of this is not counter-balanced by any material gain likely to be derived from the treatment. Only simple buboes can be aborted by these means, which are not uniformly successful; and simpler means, not at all dangerous, will often answer as well.

Iodine does not seem to me to possess any value in aborting simple bubo, and all ointments which have to be rubbed in with the fingers lead to as much harm by mechanical irritation as they do good by virtue of the medicament they contain. I am confident that I have seen great good

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[1] Keeping the patient nauseated with tartar emetic for twenty-four hours has not proved valuable in my hands, nor the expedient of gr. $\frac{1}{16}$ sulphide of calcium, hourly, although I have as yet had but little experience with the latter remedy.

follow the application of the following lotion to the skin over the gland, several times a day, with a camel's hair brush:

℞. Tr. aconiti rad.,
Tr. belladonnæ, āā..... q. s.
M.

If the skin be tender, so as to experience any irritation from this application, the lotion may be diluted with water. It is not desirable to irritate the skin. Cold applications I have not found to be trustworthy, and heat is not desirable at the very first.

Should the bubo fail to abort and go on to suppuration, it is not necessary in all cases to open it. The popular idea that it is harmful to put back (*i. e.*, prevent suppuration in) a bubo is entirely without foundation in fact. If the bubo has slowly and deliberately advanced, it cannot be virulent, and the pus it contains may be absorbed in some instances. The proper treatment in most cases is rest and slight pressure constantly applied to the gland, with the use of iodine locally, which, under these circumstances, is of value. The pure tincture of iodine should not be used; it hardens and dries up the skin, and causes irritation. Further absorption of iodine is also impossible after the first few applications, which make out of the epidermis a barrier against absorption as absolute as the shoe does for the foot. The compound tincture diluted with an equal quantity of water, and kept applied sufficiently often to keep up a slight yellow color of the surface, is all that is necessary.

If the little abscess makes the skin tense, and its history proves it not to be virulent, it may be evacuated by aspiration, with a fine aspiration-needle introduced through the healthy skin near the point of suppuration, and thrust obliquely into the cavity of the abscess.

By these means, with good food, cod-liver oil, and tonics, a bubo which has suppurated may sometimes be discussed without leaving a scar. The reddened skin grows pale, the tense shining surface flattens and scales off, the watery parts of the pus are absorbed into the circulation, then the solid parts undergo fatty metamorphosis, become disintegrated, and are slowly taken up by the circulation and disposed of.

When an abscess of a gland forms rather promptly in spite of efforts to arrest it, when the collection of pus is large, when the patient desires to save time by encouraging suppuration, a poultice of equal parts of ground flaxseed and elm bark, put on hot and frequently changed, is the best local application. As soon as the skin has adhered all around, and a central soft spot of fluctuation can be detected, it is proper to open the abscess. No harm is done if it is opened too soon, and great mischief may result if the opening is too long delayed, and the bubo should finally prove virulent. In case of doubt whether pus has formed or not, a large needle (2 Dieulafoi) upon a subcutaneous injection syringe, acting as an exploring needle, will solve the doubt. In all cases where any shade of doubt exists that the bubo may possibly be virulent, no time should be lost, and an opening is to be made on the first evidence of suppuration.

To open a bubo a few precautions must be observed. After removing the poultice, washing and drying the parts, all the hairs likely to interfere with the dressing should be cut short. A curved, sharp-pointed bistoury is passed into the cavity of the abscess at its highest or lowest part. Once in the cavity, the point is made promptly to follow the long

axis of the cavity wherever that may lead, and is brought out through the skin at this point. Then, by a sliding motion, the bistoury incises the skin between the points of entrance and exit, and the greatest possible length of incision which the length of the cavity of the abscess will allow, is thus attained. There is no possible advantage in a small incision. The object is to obtain a free exit for the pus, which may be virulent. Hæmorrhage is not to be feared from a simple incision of the skin; it will certainly heal as soon as the cavity of the abscess fills. The trouble with incisions generally is that they are too short, and have to be kept open by a variety of means, after a while, in order to allow the cavity of the abscess time to fill up. The long axis of the cavity of the abscess is the best guide for the direction of the incision, starting, of course, at the most dependent part of the cavity of the abscess, or at its highest point. The direction of the cut is generally along the fold of the groin; but this is a matter of no importance, except in people who are very fat—and these are less likely to have suppurating buboes than others.

If exposure of the cut edge of the skin to the air for a few moments does not arrest hæmorrhage, the oozing surfaces may be touched with the liquid subsulphate of iron, and any spirting point tied. The excess of pus and blood that wells through the cut is washed away, the epidermis of the cut edges greased with vaseline, and a dry dressing of absorbent cotton at once applied. This is to be changed repeatedly at first. No exploration of the abscess is desirable, no pressure upon it allowable, until after it has digested for a day or two, and disclosed its character. No poultice should be used after the incision.

If the diagnosis of simple bubo has been correct, the cavity fills promptly, and, by the aid of a little balsam or indifferent stimulating lotion, closes in a reasonable period. If the bubo has been virulent the open cavity of the abscess is a chancroid, and requires treatment as such.

Treatment of indolent bubo.—Indolent bubo cannot be put back by aconite, or belladonna, or iodine, at the start. From the beginning to the end the best local treatment for indolent bubo is pressure. This cannot be satisfactorily obtained except by confining the patient more or less. A good method of applying pressure is to put the patient upon his back, make a nest of one or two thicknesses of woollen batting over the lump in the groin, and upon this place a canvas bag partly filled with very fine bird-shot, regulating the pressure by the tolerance of the patient. Two or three pounds is generally all that can be comfortably borne, although the patient may bravely start out with a heavier weight. Pressure by the pad of a truss (Ricord) is only applicable, if at all, to discuss an indolent bubo, not to abort it.

Another excellent method of effecting pressure is to moisten one or two fine sponges, and dry them under heavy pressure, so that when dried they are thin and flat. One or more of these is now bound by a spica bandage tightly over the indolent gland, and when the parts have become accustomed to the pressure, the bandage and sponges are moistened with hot water. The swelling of the sponges causes a great amount of soft equable pressure. Every twenty-four hours the sponges and bandages are to be renewed.

If the patient cannot attend properly to pressure, and have it thoroughly carried out, other expedients may be resorted to. Here the tincture of iodine may be used with advantage, but more by virtue of its counter-irritating properties than for any special property of the iodine.

The surface should be kept black, cracked, and sore, new iodine being applied when the epidermis scales off. Blisters of cantharidal collodion, applied one after another, are also of value, as is punctate cauterization applied with Paquelin's thermo-cautery. The platinum point is first brought to a white heat, kept at that point of temperature, and rapidly touched upon the skin over the tumor, at twenty to fifty different spots, according to the size of the lump. The application is not very painful, and a good effect in a resolvent way is often produced upon the indolent glands during the formation and separation of the minute sloughs.[1]

Should suppuration come on, it does not call for any modification in the treatment. The suppuration is generally peri-glandular, and its entire absorption may sometimes be brought about by pressure. Should the abscess open spontaneously, or be opened by the surgeon to discharge its bloody-looking serum, the treatment by pressure may be continued uninterruptedly.

If the knife be used, and time be valuable to the patient, the best and most satisfactory treatment of indolent bubo, after peri-glandular suppuration has occurred, is in many cases, undoubtedly, extirpation of the offending glands. Ether should be given, all pockets and sinuses laid freely open, and all the diseased glands scraped out with the finger or sharp spoon; or, if they are very large and adherent below, transfixed with a double ligature through the pedunculated portion, which is to be securely tied before the gland is cut away. All the enlarged glands being removed, and hæmorrhage arrested by tying bleeding points, or applying subsulphate of iron or the Paquelin cautery, the gaping cavity is stuffed full of oakum soaked in balsam of Peru. Any stimulating dressing may be applied later. This treatment is generally more satisfactory than the extensive use of caustic pastes sometimes employed in these cases.

The appropriate internal remedies for indolent bubo are tonics, generous diet, with wine and cod-liver oil.

Virulent bubo.—The virulent bubo is a subcutaneous chancroid. It is known sometimes as the bubo of absorption. Some of the true chancroidal virus, whatever it may be, has ascended the lymphatic channels and lodged in a gland. Here it breeds, promptly calls ulcerative action into play to effect its own elimination, and immediately begins to work its way to the surface, where an ulcer finally appears as a chancroid. Therefore suppuration is inevitable.

A virulent bubo may arise from a simple, from an inflamed, or from a phagedenic chancroid. There is no certain date of its appearance. It may commence very late. In Puche's[2] well-known case it came on three years after the appearance of a phagedenic serpiginous chancroid. Occasionally it declares itself just as the simple chancroid from which it arises is getting well. It is usually mono-glandular. Sometimes double bubo exists with a single chancroid—on one side a simple bubo, on the other virulent.

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[1] In a recent German journal, a new method of treating these indolent glands is spoken of by Jacubowitz. He injects into them a watery solution of the iodine of potassium, one part to thirty. He injected in one case, at one sitting, into one gland as large as a goose-egg, gr. xv. of the iodide in ℥ i. of water, injecting small quantities into different parts of the gland. He repeated this injection during two days, four times with success, as he claims. Multiple acupuncture has also been well spoken of. I have not yet tried either of these methods.

[2] Leçons sur le chancre : Ricord (Fournier). 2d ed., 1860, p. 46.

There is no positive diagnostic feature which distinguishes virulent from simple suppurating bubo at first; but the course of the virulent bubo is more active, more violent. Peri-adenitis with suppuration is quite apt to occur about a virulent bubo. The pus formed outside the gland in such a case is not virulent until poisoned by contact of the pus within the gland. Ricord's beautiful demonstration of this is well known. The case is one in which a peri-glandular abscess was opened, and its pus inoculated with negative effect. At the same time a gland lying at the bottom of the abscess was punctured, and a drop of pus taken from its centre was auto-inoculated with positive result. What more brilliant demonstration can be required of the difference in acridity of simple pus and the poisonous pus of chancroid.

The first features of virulent bubo, then, are precisely those of simple suppurating adenitis accentuated. As soon as virulent bubo is opened to the air, its true chancroidal characters begin to appear. The cut edge of the skin becomes at once inoculated, and the whole cut border ulcerates. The opening, whether made by nature or the knife, grows larger by being eaten away by the slowly advancing ulceration. The borders of the ulcer get hard, livid, undermined, while the integument surrounding the edges of the sore assumes a dusky purple hue, perhaps perforates in a new spot, or sloughs away in pieces. The bottom of the abscess, now an ulcer, becomes irregular, worm-eaten, covered with a pultaceous, adherent deposit, discharging plentifully an ill-conditioned pus, inoculable upon the bearer.

This ulcer, with its ragged, abrupt, ulcerated, and undermined edges, its uneven, pultaceous floor, and auto-inoculable discharge, is a true chancroid, subject to all the complications to which chancroid is liable. The pus may burrow along the groin, down the thigh, or upon the abdomen, leading to obstinate sinuses which much prolong the duration of the sore.

Phagedæna, either in the sloughing or in the serpiginous form, may attack a chancroidal bubo. The latter is more common, and is usually the orign of those extensive chancroids which last for so many years. One such of fourteen years' duration is on record. The course of serpiginous chancroid in the groin is usually upward over the abdomet, where it generally stops after having occasioned considerable destruction of tissue.

The tissues sought out for destruction by serpiginous phagedæna are the connective and cutaneous layers down to the deep fascia. It is a very common thing in a large hospital to see a poor fellow, who has been on his back for weeks or months, with a raw spot in the groin and over the abdomen, as large as the hand, from the floor of which several large, raw-looking, unhealthy glands project. The glands have been spared by the phagedenic action, which has swept away everything else down to the deep fascia.

If the phagedæna does not exhaust itself upon the abdomen, it generally turns downward after a time and takes possession of the thigh. The thorax, although not absolutely proof against phagedæna (as, indeed, even the face is not), yet is very rarely attacked by it. For this reason, the chest-wall below the nipple is the position generally selected for diagnostic auto-inoculation of phagedenic sores.

A phagedenic bubo may have originated from a non-phagedenic chancroid, just as a phagedenic chancroid of the penis may have a simple bubo or no bubo at all. Other points relative to phagedæna may be found upon p. 38 et seq.

Treatment of virulent bubo.—When it is suspected, from the rapidity of impending suppuration, that a given bubo is virulent, it is wiser not to poultice it at all. No external applications, no internal medication is of any value. Suppuration need not be encouraged—it is certain to come promptly enough. Above all things, no leeches or blisters should be applied to break the skin and furnish new foci for inoculation after the bubo has begun to discharge. As soon as even a few drops of pus have collected the knife should be used, and the suppurating cavity laid freely open. The peri-glandular suppuration being nearer the surface and in less dense tissue, can sometimes be opened without cutting into the gland at all. When this can be done, it is very desirable. The gland surely will open later; but the point of importance is the size of the cavity outside of the gland, which must eventually become one vast chancroid. The sooner this outside cavity is opened to the air the smaller it will be, and the longer it can remain open without becoming poisoned with the discharges from the virulent gland the greater is the chance that its walls will consolidate and extensive burrowing be prevented. Therefore, it is wise to open any bubo, which has rapidly advanced to suppuration, at the earliest possible moment after pus has formed, to cut through the integument from without inward, if there is very little matter and not a considerable cavity full of pus, and to endeavor to determine whether the suppuration may not be exclusively peri-glandular. Should it prove so, the gland might be taken out at once unopened, and there is a possibility that the abscess might remain simple, instead of becoming chancroidal. If both collections are opened together, however, or, what is more customary, if the outer abscess has already become contaminated by the glandular abscess, before either of them have been opened, then the abscess is already a chancroid before it is opened, and the passage of a knife through it does not alter its character.

The line of treatment, now, is that suitable for a large chancroid. Cauterization is not desirable, cleanliness is of the first importance, iodoform the best remedy. Any pouching of the borders indicating a tendency to burrow should be counteracted by prompt incision to the bottom of the pouch. The cut edges will become ulcerated and the chancroid enlarged, but this is preferable to the formation of a sinus. A little absorbent cotton should lie constantly upon the ulcer to suck up the discharges as they form. The general detail of management is the same as that for ordinary chancroid, p. 41.

Should a virulent bubo commence to grow phagedenic while under observation, no time is to be lost. The most thorough cauterization possible is all that can be done; and if this is undertaken promptly, and efficiently carried out, the new enemy may often be destroyed along with the old one. The general and local management of phagedæna have been given on p. 41 et seq.

PART II.

CHAPTER I.

SYPHILIS.

General Considerations upon Syphilis.—Definition of Syphilis.—Effects of Climate upon the Disease.—Present Mildness as compared with former Virulence.—Outline of the Course of Syphilis.—General Pathology of Syphilis.—General Description of the Pathology of the various Lesions due to Syphilis, and the Lack of any Specific Quality in the Elements constituting these various Lesions.

Definition.—Syphilis is a specific disease, acquired only by inheritance or by direct contact of a surface capable of absorption with the poisoned secretions of a person already diseased. It is characterized by periods of eruption of varying severity, and periods of repose of varying duration. The earlier symptoms are superficial, the latest involve the viscera. No organ in the body is exempt from paying tribute to the disease; the connective tissue suffers most. Treatment may shorten and modify the disease; time alone can wear it out. A perfect recovery is possible.

GENERAL CONSIDERATIONS.

The foregoing definition simply touches upon the outskirts of syphilis. Nothing can define it short of a detailed description. It is a disease of magnificent exceptions, full of absorbing interest. It resembles everything, and yet retains that special type of personal individuality which enables the careful student to ferret out its peculiarities amidst a labyrinth of symptoms due to other causes, and triumphantly to institute a treatment which is almost certain to lead to a happy result. The origin of syphilis is involved in impenetrable darkness. It has been the subject of learned essays, and volumes have been written to prove all manner of things concerning it. Captain Dabry affirms that it was well known among the Chinese two thousand years before Christ, and many believe that it has existed in all countries ever since, under a variety of unpronounceable names; that it was known to physicians of ancient days, and during the middle ages, although its nature was not then fully recognized. Another equally stalwart corps of controversialists aver as hotly in other learned essays, equally founded upon fact, that the disease was brought from America upon the ships of Columbus, and from this origin spread like a plague promptly through all Europe.

In a text-book proposing to deal with practical questions, much dis-

cussion upon this point is as unprofitable as it must be stale, for there are no new facts to adduce, only new combinations of them to be made, and no adequate advantage attaches to a successful accomplishment of the task.

It is well, however, to know that syphilis was not recognized as a morbid unity until the end of the fifteenth century, at and after the period of the siege of Naples (1494–5) by Charles VIII. That then, and for a considerable time thereafter, the disease behaved with unwonted virulence, attacking all classes of society, and killing a large number of its victims. From that time to the present day, syphilis has been a subject of peculiar interest to all classes of medical men. It enters the domain of every branch of pathology. A close acquaintance with it is claimed by the physician, the surgeon, the specialist, in nearly all branches. Miles of pages have been written about it, and yet all is not known. Every year adds to our exact knowledge, and brings new symptoms and new growths of morbid phenomena into the fold of syphilis, which were not there before. Nearly all the important questions in syphilis are still in dispute among high authorities: Is the poison single or double—capable of producing only one, or of yielding two diseases? Is it peculiar to man, or may animals also be affected? What secretions will transmit the disease, and what secretions are innocuous? Is it curable, or not? What treatment is best? All these, and many more important questions, are not finally settled to the satisfaction of the profession at large. The question of syphilis of the nervous system has been probably nearly solved of late years, and the lesions of inherited syphilis are in a fair way to be clearly comprehended; but the whole question of hereditary transmission from the father is involved in unspeakable doubt, the facts on both sides being nearly equally strong.

To the quack, syphilis is a glorious harvest; to the unprofessional mind, a mysterious horror of nastiness; to the medical student, a simple sequence of chancre, secondaries, and tertiaries, easily cured—the first and second by mercury, the last by "potash," as he puts it; and to the earnest student, a mine of increasing interest, always yielding new treasures to honest toil, full of pleasant surprises, comforting by the sense of power a knowledge of its truths conveys, and going far to create in the physician respect for the art he practises and a certain amount of belief in the specific action of drugs.

Syphilis is encountered everywhere—in the palace of the mighty, in the hovel of the slave. It infects the infant before its first breath, and attends the gray hairs of age tottering to the tomb. The point of entrance of the poison may not be found, need not be sought generally, and no amount of respectability can be a guarantee that any given individual may not have encountered one of the protean forms of approach which this monster is capable of assuming.

Whatever and wherever was the first origin of syphilis matters little; now it is everywhere, and probably spreading. All countries on the globe possess it. Iceland and Africa are said to suffer least; but, whatever immunity the African may enjoy at home, he loses by transplantation, for all the worst forms of syphilis are seen in the negro in this country.

In certain parts of the world syphilis is said to be exceptionally mild, as in Portugal. H. Lee quotes Ferguson as ascribing this to the fact that the population are saturated with syphilis, and owe their immunity to the fact that they are for the most part derived from syphilitic parents. Lee believes also that the lower classes in other countries are in a measure pro-

tected from severe syphilis in the same way, and that the children of syphilitic parents who themselves have inherited no disease, have yet derived from their parents a measurable protection from severe attacks of syphilis. In certain countries, on the other hand, syphilis is said to be exceptionally malignant—South Sea Islands, Mexico. The acquisition of syphilis by one race of people from another is believed to produce a severe type of disease. Syphilis acquired by Europeans from the Chinese, or by residents of the United States from Central or South Americans, is said to be unusually bad in its results. It is well known that sailors habitually have the disease severely, and they acquire it, doubtless, often in foreign ports. Hirsch[1] has shown that no necessarily good or bad influence upon the evolution of syphilis attaches to climate alone. In a general way an equable climate is less unfavorable than an uneven one. A person not acclimated is believed to be more apt to suffer severely in any climate than a native, if he gets his poison from a native; while, on the other hand, it has been frequently noticed that where the disease is imported into a country previously exempt, the inhabitants fall beneath the new malady as under a plague.

A natural deduction from the foregoing facts is, that finally syphilis will become uniformly acclimated all over the world; that it will diminish in severity as it increases in extent, and perhaps, at last, may exhaust its virulence entirely. Certain it is that the syphilis of the present day is not the syphilis we read of in the past. It can be recognized as the same disease; all the features are there, but much of the sting has gone out of it. Occasional cases of malignant syphilis and bad types of disease still appear to remind us of what the poison can do, and the damaging blight which the inherited taint often inflicts upon its innocent victim attests the continued virulence of the malady. In a majority of cases, however, in reasonably healthy persons, the type of the disease, as encountered at the present day, is mild: it can be controlled to a great extent by treatment; thousands of individuals pass through it, unharmed in tissue, in feature, in function, to reach a green old age and die of natural causes, leaving behind them healthy offspring, who know not the sins of their fathers.

OUTLINE OF THE COURSE OF SYPHILIS.

After contact of the poison with a surface capable of absorption, nothing unusual happens for several weeks; this is the period of incubation, in which the disease, already acquired, is supposed to hatch or ripen. A period of incubation is quite common in contagious diseases, especially in those which involve the blood. When poison is brought into contact with the tissues, if its effect is to be local there is no incubation; witness the poison of the bee, of the mosquito, of chancroid. If its effect is to be general, it lies dormant while increasing in the blood, until finally it has accumulated enough force to break out and produce symptoms; and these symptoms may be general from the first, as in measles, scarlet fever, smallpox; or a lesion may first reappear at the point of entrance of the poison—hydrophobia, syphilis.

The lesion which first appears at the inoculated point is called a chancre, whether it appears upon the genitals, the fingers, the face, or else-

[1] Handbuch der histor. geograph. Pathologie. Erlangen, 1860.

where—whether it is a dry papule, a moist tubercle, or an excavated ulcer. This lesion is generally attended by a peculiar hardness of the tissues immediately underlying it, known as a specific induration. Within two weeks the neighboring lymphatic glands generally become slightly enlarged and very hard, in an almost painless manner, many glands being usually involved at the same time. None of these glands suppurate as a rule.

Generally, in about a month after the glands enlarge, after the second period of incubation, an eruption appears scattered more or less uniformly over the whole body. These eruptions, for there are a number of them which may appear—pustular, papular, erythematous, squamous, differing in intensity in different individuals—these eruptions are all characterized by certain general peculiarities, to be detailed later, which stamp them with an individuality found by experience to belong to no other group of eruptions. Their color is peculiar, their grouping, their course, the absence of pain or itching, and other features, generally make it easy to distinguish these eruptions from others composed of the same elementary lesions, but due to a different cause.

Just before the outbreak of the first of the early eruptions, some patients (perhaps one-third) suffer from a mild amount of fever, the temperature, generally moderate, in exceptional cases mounting quite high. Also, coincidently with the first general eruption, or before it, there is a tendency to a slight general indolent engorgement of certain lymphatic glands, notably the post-cervical chain and the epi-trochlear glands. Rheumatoid pains are often complained of—worse at night. Sometimes there is headache, a general fall of hair is often noticed (alopecia), and acute iritis may be an attendant symptom.

Also, with the first eruptions, or just before them, erythematous patches, erosions, ulcers, and peculiar lesions called mucous patches, are quite certain to make their appearance within the mouth and upon the throat of the patient. Such erosions, patches, and ulcers crop out from time to time throughout the entire course of syphilis, often continuing to appear for many months after all other evidences of the disease, local and general, have passed away.

Several outbreaks upon the skin may follow each other during the first year. In such case the eruptions are generally slower in their course, each succeeding one a little slower than its predecessor, a little deeper-seated in the integument and less generalized in distribution, more grouped into patches.

The bodily health sometimes fails considerably during the first year, but it sometimes remains seemingly undisturbed, more especially in those cases in which the stomach retains its tone and the appetite continues fair.

At the end of a year or more of such outbreaks, there is a natural lull in the course of the disease. There may be an entire absence of symptoms for many months. In very exceptional cases the lull remains permanent, and the patient seems to be and to remain well from that time on. Usually, however, after a period of quiescence more or less long, new outbreaks appear upon the skin, in groups of pustules, scales, or papules, and new, whitened, excoriated patches and ragged ulcers come out upon the fauces and in the mouth. Periosteal pains in all the superficial bones are now apt to make themselves felt, chiefly at night, and a certain amount of failure in general health is customary.

This state of things prolongs itself for a period varying from a few

months to two years or more, and terminates by leaving the patient sound and well, or by merging into the next, the tertiary stage. The stage just described is sometimes known as intermediary; the eruptions occurring in it often leave slight permanent scars.

In a typical case, after an interval, or, perhaps, without any halt, the disease puts forth its last group of symptoms. These symptoms are exceedingly variable in intensity and extent. All the superficial, as well as the deep textures of the body, as well as all of the internal organs, may be involved in these lesions. The lesions of this stage, wherever they occur, are characterized by connective-tissue hyperplasia, or by gummatous deposits, and in either case, by thickening of the walls of arteries within the pathological areas. In the skin, patches of tubercles and serpiginous ulcers appear: ecthyma and rupia, gummata of the subcutaneous tissues. Nearly all the lesions of this stage leave deep scars. The throat may be attacked by rapidly destructive gummy ulceration, the bones of the nose may die and come away. Ulcers may develop upon the mucous membrane of the stomach and intestine, and cut off nutrition. The liver, the lungs, the kidneys, the heart, all have their chance at suffering from tertiary disease, as indeed do all the internal organs and tissues. The brain comes in largely for a share of notice when the phenomena of tertiary syphilis are mentioned. Nearly all known chronic diseases giving symptoms through the brain, or through the nerves, may be simulated by the symptoms of tertiary syphilitic disease of the brain and nerves. Chorea, epilepsy, paraplegia, hemiplegia, nearly all forms of paralysis, aphasia, dementia, insanity, mania, and many other maladies often owe their origin to tertiary syphilis, and are perfectly curable by a well-directed course of anti-syphilitic medication.

The bones, and joints, and tendons, and bursæ, and muscles, must not be forgotten. They all offer tribute to tertiary syphilitic disease, and furnish appropriate symptoms, as do indeed all the structures of the body.

After yielding symptoms in the tertiary stage, more or less severe in type, syphilis in course of nature declines, and leaves its victim spontaneously. But, before this period has arrived, such vital organs may have become involved in permanent changes in their structure, due to syphilis, that health is no longer possible, and sometimes life itself cannot be sustained. Death, as a direct result of syphilis, is uncommon in the adult, but may be produced by the occurrence of structural changes in the vital organs, or by the cachexia of tertiary syphilis. Cachexia is one of the marked phenomena of this stage, and sometimes seems to be independent of obvious organic changes in the tissues.

This glimpse of the natural history of syphilis is far from perfect. The glory of syphilis is its irregularity. No two cases exactly resemble each other, and yet the family likeness is quite strong in all. Whole groups of customary symptoms may be omitted during the evolution of the disease. Symptoms may be strangely out of place. Tertiary gummata occasionally appear a few months after chancre, and symptoms of brain syphilis in the same period, while, on the other hand, erythematous and scaly spots upon the palms, the soles, and in the mouth, may crop out long after even the tertiary period seems to have come to a natural end.

Constant vigilance on the part of the diagnostician is called for in the investigation of many of the desperate phenomena of various chronic diseases, to decide if there be anything in them suggestive of syphilis. Such

a cause is often found when least expected, and the reward amply repays a careful search, for no serious case is so desperate but that the prognosis is bettered, if new light can be thrown upon it by ascribing it to syphilis as a cause. A well-directed treatment in such a case will sometimes render favorable a prognosis which, without it, must have been fatal.

THE GENERAL PATHOLOGY OF SYPHILIS.

The changes wrought by syphilis upon the organs and tissues of the body are very limited in number and very uniform in type, but the symptoms to which they give rise are as varied as are the functions of the organs and tissues involved. When the poison is first absorbed, no one knows what becomes of it. It is probably increasing in quantity during the period of incubation, and working its way through the lymphatics into the system. Some authorities believe that it only grows locally during the first period of incubation. The blood quickly begins to feel the influence of the poison, and, as first clearly shown by Ricord and Grassi, to experience a diminution in the bulk of its red globular contents, while the amount of albumen and of white cells become increased. The latter change, as Virchow has shown, is doubtless due to the fact that a number of the lymphatic glands are in a state of irritation due to the poison.

Aside from these changes—which have in them nothing peculiar to syphilis, since they are apt to be found as well in any other debilitating disease—the pathological individuality of syphilis always shows itself in all stages of the disease, through the medium of congestion, of new connective-tissue formation, or of new cellular growth, and the three are usually more or less combined. They are found in the chancre (page 15), they all exist in the syphilitic bubo. There is an afflux of blood to the part, the bundles of connective-tissue fibres are thickened and condensed, and a large number of new cells are present. These cells resemble leucocytes, the white corpuscles of the blood. According to Cohnheim, they are nothing else but out-wandered cells, which formerly were white blood-corpuscles; yet the great pathologist Virchow cannot distinguish between these white cells found in the syphilitic chancre and the cells found in a fresh gummy tumor. Who then shall decide that there is anything specific microscopically in the character of syphilitic tissue? It is in the structure and arrangement, not in the elements of syphilitic new-growths, that the microscopist seeks to make a distinction between them and other morbid neoplasms.

The roseola of syphilis is largely congestive, and due to vaso-motor paresis in the terminal capillaries upon certain areas of skin. In the papule, there is cellular infiltration as well. In the pustule and vesicle, the exudation of pus and serum beneath the epidermis has no character imprinted upon it, by its syphilitic origin, which the microscope can detect, and so on through the various lesions of the skin. The later cutaneous manifestations are, as a rule, gummatous. The tubercles, the ulcers, the gummata of the skin, are all essentially different varieties of gummatous infiltration. They all undergo, in the evolution of the lesion, the natural retrograde, fatty-granular metamorphosis which is the natural termination of pure gummatous products.

Within the body there are three pathological types of change due to syphilis: connective tissue hyperplasia, gummatous deposit, arterial thick-

ening, and two secondary changes often following prolonged syphilitic disturbance—atheroma and amyloid degeneration.

The connective-tissue hyperplasia plays perhaps the most important part of all. The elements of all the organs in the body are separated and held together, suspended, as it were, in an atmosphere of connective tissue. Even the brain has its fine connective-tissue parenchyma, and the substance of the bone is none the less a variety of connective tissue because it happens to be solidified with earthy salts.

One of the commonest expressions of visceral syphilis is that the connective-tissue parenchyma of a given organ undergoes hyperplasia. Its elements increase in number, soft round cells and spindle-cells appear, while all the meshes of the tissue become more succulent from congestion. This state of things, however, does not last long. The hypertrophic process comes to a stop, the blood recedes from the congested vessels, the succulent new tissue forms into fibres and contracts; cirrhosis is the result. Fibrous bands, with all the retractile quality of cicatricial tissue, now replace the former delicate connective-tissue atmosphere of the organ involved. The result is inevitable. The delicate, essential component elements of the gland or the organ which has been the seat of this change become squeezed, and partly strangulated by the unwonted pressure exerted upon them from all sides, and the function of the organ becomes thereby necessarily impaired.

But there is nothing specific in this form of connective-tissue hyperplasia. Other forms of cirrhotic change closely resemble it in all microscopic details.

The gummy tumor (syphiloma of Wagner) is a specific product. It is not due to any other malady or to any morbid process other than syphilis; but there is nothing distinctive about the cells of a gumma. They are nucleated cells, as seen in a young gumma, looking more or less like white blood-cells. They lie very closely crowded together in among the elements of the other tissues, which they push aside. A few spindle-cells are generally found among the succulent round cells, showing the tendency of the tissue to organize into connective tissue.

Such collections of cells may develop in a connective-tissue stroma anywhere: in or under the skin, under the periosteum, in the Haversian canals, in the brain, the tongue, the throat, the lungs, the liver, the spleen, the kidneys, the testicle; in any place where connective tissue and blood-vessels are found—in short, almost anywhere in the body. Gummata commence to form usually around small blood-vessels or in the adventitia of large ones, and are found of minute size scattered along the fibrous septa of an organ in connection with more or less general connective-tissue hyperplasia, or as a single large nodule of independent formation, seemingly a solitary lesion amid surrounding health.

The connective tissue around a large gumma becomes condensed and thickened into a sort of fibrous envelope for the newly formed mass. After a time the gumma reaches the size which it is to attain, and then degenerative changes commence in it. According to Rindfleisch, this is a mucous metamorphosis of the cells of the gumma, commencing centrally in the mass. The cells now disintegrate and become caseous. Sometimes they are wholly absorbed, the spot remaining as a hard cicatrix. This cicatrix represents mainly the outside connective-tissue thickening which surrounded the gumma, puckered in and occupying a depressed area corresponding to the position and proportionate to the size of the original lesion. Fatty granular degeneration and caseous transformation in

large gummata surrounded by a considerable cyst-wall of condensed connective tissue yield a fluid—a sirupy or a cheesy mass, according to circumstances. This mass may persist for a time, and often to the unaided eye much resembles pus, especially when seen in subcutaneous gummata. These collections may persist for a long time in internal organs, not necessarily doing much damage. The danger from a gumma is usually directly in proportion to the importance of its place of development. A small gumma compressing a large vessel will naturally cause more physical disturbance than a larger gumma more safely situated. One of the common (the most common) conditions in which to find an old gumma is a tough, dirty white, or yellowish cicatrix containing the atrophied remains of the tissue originally invaded by the gummatous infiltration, and more or less of the unabsorbed caseous remains of the gummatous cells themselves.

Gummata situated near the surface generally tend to act like abscesses, to soften centrally and then ulcerate their way to the surface, discharge and eliminate themselves in the form of gummy ulcers, and, unless they become serpiginous, slowly to cicatrize.

The gummatous material is not then in itself specific, but its peculiar quality is evident to any one studying its course. Similar material to that constituting gumma is found in syphilitic chancre and in some of the secondary lesions; yet it acts in a different way, being absorbed without material destruction of tissue, and often without leaving any scar in the first instance, although not necessarily without scar in the second. This difference has been explained by the hypothesis that the actual syphilitic virus comes into contact with the tissues directly at the point of chancre, and in the secondary stage through the medium of the poisonous blood; that these tissues behave in one way under these circumstances, but in a totally different way when they undergo a specific reaction from some incidental cause, having themselves been previously modified by contact with a poison which has now ceased to exist; for it is well known that the blood in tertiary syphilis is not poisonous directly, or, at least, cannot be directly hetero-inoculated with a positive result. This explanation is pure theory, and only explains what is undoubtedly a fact by stating it in other terms.

Another pathological change produced by syphilis is a modification in the walls of the blood-vessels. Biesiadecki found the vessels thickened in the primary lesion, but it has been since discovered that this thickening is a constant accompaniment of all inflammatory, especially chronic inflammatory changes. Huebner, in his studies of brain syphilis, claims that a large share of the important pathological changes which occur in that organ are due primarily to changes in the walls of the arteries of the brain, commencing as an endo-arteritis, and culminating in a thickening of the wall of the vessel and an obliteration of its calibre. The syphilitic endo-arterial changes occurring in the different large arteries of the body, unquestionably in undergoing retrogressive metamorphosis, lead directly to atheroma and a weakening of the arterial wall, and this again becomes a direct cause of aneurism.

The amyloid changes so often found after death in liver, spleen, and kidneys, in subjects who have long suffered from syphilitic cachexia, do not differ from the amyloid changes due to other causes—such as prolonged suppuration. It is only syphilitic in that it is quite frequently encountered in connection with that disease.

CHAPTER II.

SYPHILIS.

The Poison of Syphilis: is it a Vegetable Fungus?—The Production of Syphilis in Different Animals.—The Alleged Antagonism between Syphilis and Cancer.—Secretions which contain the Poison of Syphilis.—Peculiar Virulence of the Secretion of Mucous Patches.—Vaccinal Syphilis.—Pathological Secretions.—Physiological Secretions.—Infection by Milk; by Semen.—Transmission of Syphilis by Inheritance through the Mother alone; through the Father alone.—Date at which a Healthy Pregnant Woman must get Syphilis in order to Poison her Child.—Choc en-retour.—Transmission by Inheritance to the Third Generation.

The poison of syphilis.—That syphilis is essentially a poison has always been conceded; but two points regarding it have given rise to much dispute, namely: exactly what the poison is, and exactly where it resides. Both of these points are still the subject of earnest investigation, and much serious and honest difference of opinon exists about them among intelligent men.

Humoral pathologists had no difficulty with poisons in the blood. An assumed condition of irregularity in the fluids of the body was a humor, and any amount of theory could be manufactured to fit the facts as they appeared. Pathology of the present day is more exact, and demands tangible evidence and proof of what a virus is, or else it confesses its ignorance, and simply retains the term virus because that is a familiar one, and because there is none better at hand. An assumption of a poisonous quality in that which is the essence of syphilis serves practically to assist in accounting for the phenomena of the disease, yet pathology does not claim to know at all what the poison of syphilis is. The poison of chancroid—most virulent in its local effects, the poison of phagedæna, of measles, of scarlet fever, of rabies, of erysipelas, of septicæmia, and many others, none of these are known except by their effects. The snake-poison, which may easily be collected and examined, does not disclose to the microscopist, or to the chemist, in just what its poison consists. We must, therefore, be satisfied for the present where we are, and wait until science has advanced a step farther, and has been able to separate the syphilitic poison from the fluids which contain it, while we still acknowledge that a poison does exist, because the phenomena of the disease are best accounted for upon that hypothesis. As to what the poison is, it is wiser to confess ignorance.

The advance which modern investigation is making toward a discovery of the exact cause of septic disease tends to locate these poisons in living germs. Intimations have recently appeared in print that a granular substance has been discovered in snake-poison, in which presumably resides the septic principle. The minute, rounded, microscopic bodies strongly refracting the light, which sink to the bottom after a time in a tube containing pure vaccine lymph, have been shown by the investiga-

tions of Chauveau and Burdon Sanderson to be actually the contagious element of the lymph. The contagious quality has been shown not to reside in the liquid portions of the fluid. The strong advocates in modern days of the bacterial origin of diphtheria, erysipelas, anthrax, inflammatory changes in the tissues, show the drift of scientific thought; and although, unfortunately, the difference between the bacteria producing diphtheria and those supposed to produce other diseases has not been made out, yet it is to be hoped that closer investigation may eventually discover in them distinguishing traits.

The same efforts to discover a living germ as the poison of syphilis have been, and are still, being made in the profession. Salisbury and Hallier both discovered a fungus which they believed to be the cause of syphilis; but other observers have failed to accept their conclusions, and the latter have gradually disappeared from view. More recently Lostorfer found some little shining corpuscles in the blood of syphilitic patients, which seemed to behave in a peculiar manner, and immediately he announced that the poison of syphilis had at last been discovered. Competent observers promptly investigated the claims of the discoverer, and a few months were sufficient to demonstrate to the satisfaction of every one that the supposed syphilitic corpuscles were found in normal blood, probably owing their existence to the white cells of the blood. Thus faded another pleasant delusion.

Now another claimant is in the field for the honor of discovering the germ which bears the poison of syphilis. Klebs, a well-known and thoroughly capable observer, cultivates a spore which he finds in syphilitic blood (apparently a moving bacterium), produces a plant, inoculates it upon an ape, produces consecutive ulcers recalling the ulcers of syphilis clinically and histologically, shows them to Professor Pick, who recognizes their resemblance to syphilitic ulcers, kills the animal, and finds between the dura mater and the skull a material much resembling gumma, and a quantity of organic germs analogous to the forms which had been inoculated upon the animal. Klebs[1] placed a portion of a freshly extirpated syphilitic chancre under the skin of another ape, December 29, 1877. The wound healed without suppuration, the glands swelled slightly. In six weeks the animal had fever, and shortly afterward a crop of papules came out upon the neck, head, and face. The papules were flat, two or three millimetres in diameter, and of brownish red color. These lesions scaled off, but did not ulcerate, and the papules, together with the fever, disappeared, leaving no trace. Nothing new appeared externally, but in five months after the inoculation the strength of the animal failed, and it died. Under the site occupied by the papules during life, although no deeper-seated disease had then been detected at these points, the skull showed evidences of periostitis and of caries sicca —exactly such changes as are found in man due to syphilis. A focus of interstitial fibrous thickening containing spindle-cells was found in the lung, the pleura being extensively thickened over it in a radiate manner. Certain new formations of cells resembling young syphilomata were found in the kidneys. Finally, some blood taken from this ape yielded plants looking very much like the fungus which had been inoculated upon the first ape. The parasite, Klebs says, consists at first of movable, then of stationary rods, from which latter grow spiral masses of linked

[1] Both cases are reported from the proceedings of a meeting of naturalists, at Cassel, in the Allg. Wiener med. Zeitung, October 15, 1878, p. 418.

rods. Klebs calls the plants helikomonads, does not attempt to classify them botanically, and considers them to be the cause of syphilis. A number of observers are doubtless now at work testing the conclusions of Klebs. It is certain that their accuracy will be questioned, and more than probable that the whole theory of their causal relation to syphilis will be overthrown.

E. Cutter, of Boston, in a lecture on the morphology of the blood, delivered before the American Medical Association, January 7, 1878, speaks of having found threads of mycelium and bacteria of a coppery color in syphilitic blood, and the white blood-cells full of spores, which escape by a rupture of the wall of the cell. Dr. Heitzmann, at a recent meeting of the New York Pathological Society, stated that he believed he had discovered the syphilitic poison as it exists in the blood. He declined to make it known until further study had convinced him of the accuracy of his facts. Thus it will be seen that investigation is active, but the problem is not yet solved.

Other animals, besides the apes of Klebs, have been successfully inoculated with pieces of chancre, or its secretion: guinea-pigs (Legros, Bradley), monkeys (Depaul), cats (Vernois, Bradley), and ulcers and gummata produced, leading to marasmus and death; but the profession has been slow in accepting the evidence as demonstrating syphilis in these cases. They will be mentioned farther on.

Thus far, then, no positive proof has been adduced to show what the poison of syphilis really is; many more experiments must be made before the question can be set at rest.

It has been intimated strongly by Diday and Rollet, that an antagonism existed between the poison of syphilis and the cancerous diathesis. Inoculations of syphilitic secretions capable of conveying the disease were made by Rollet, by Diday, and by Rodet, with negative result, upon cancerous patients. But this antagonism is certainly only apparent. I have seen many cases in which syphilis and cancer existed clinically in the same patient; and Hutchinson, of London, at the forty-sixth meeting of the British Medical Association, went so far as to record his belief that, while the syphilitic dyscrasia was not a cause of cancer, yet the prolonged local irritation of a syphilitic sore might induce a cancerous action in the part involved. This assertion, doubtless, refers only to epithelioma.

The secretions which contain the poison of syphilis.—The unity or duality of the syphilitic poison has been already discussed (p. 7). It remains to consider another important question, namely, in what secretions does the poison exist in such a state that it may be transmitted by contact.

The thin serous secretion of a syphilitic chancre contains the poison probably in as concentrated a state as it can be furnished by the economy. The contagiousness of chancre and its clinical hetero-inoculability in kind upon a virgin subject have never been doubted, since the initial lesion of syphilis has been recognized as the starting-point of the disease. Confrontations and direct experimental hetero-inoculations have proved this.

The authority of Hunter, in England, and the proclamation of Ricord, in Paris, made as late as 1851, that the poison of syphilis was transmissible only through the secretions of the primary syphilitic sore, and that none of the later lesions contained the poison in their secretion, controlled the opinion of the general profession for a long time after the assertion had been clinically and experimentally demonstrated to be an error.

The experiments of Wallace, of Dublin, in 1835, amply demonstrated that inoculation of the secretion taken from ulcerated mucous tubercles, and from the early pustular syphilides, would produce syphilis in a healthy subject. Waller, of Prague, followed in 1851, and since then a great number of other investigators have been added to the list, including the familiar names of Gibert, Lindwürm, Bärensprung, and Hebra, while the clinical experience of every physician who sees much syphilis constantly brings to light cases where the source of contagion has been, not chancre, but the mucous patch.

The contagious properties of secretions from mucous patches, and secondary ulcerated surfaces upon mucous membranes, have become of late years so obvious, clinically, that it is questionable whether this lesion does not divide the honors of propagating syphilis equally with chancre, or possibly even surpass its rival. Fournier has called attention to this fact, and Bäumler has emphasized it. Mucous patches and mucous tubercles, ulcers of the mucous surfaces—all these lesions secrete freely and are in a position frequently to be brought into contact with surfaces capable of absorption. The long duration of these lesions makes them especially dangerous. They last for months at a time, and relapse frequently while the syphilitic chancre, for the most part, occurs upon a patient but once in a lifetime, and is of comparatively short duration. Abrasions may be inoculated during sexual contact as well from a mucous patch as from a chancre.

Nearly all the examples of the primary lesion of syphilis encountered upon the mouth or on the face, the primary lesion of a suckling child derived from a syphilitic nurse, of a healthy nurse from an infant with inherited disease, the cases of syphilis acquired from using spoons, pipes, glass-blowers' tubes, those communicated by the surgeon through the instrumentality of the Eustachian catheter, the digital chancre of the accoucheur—in all of these, quite certainly in most instances, the vehicle of the poison has been the secretion of a mucous patch.

Perhaps the best recorded clinical evidence of the inoculability of mucous patches and ulcers is that furnished recently by the report of Maury and Dulles,[1] of Philadelphia. James Kelly, it appears, gained his support by walking through the country and tattooing, for a small sum, all those whom he could induce to submit to his mutilation. Along his track it was found that fifteen individuals had acquired chancre at the tattooed points, with subsequent syphilis, out of twenty-two tattooed. Kelly was in the habit of putting his needles into his mouth and mixing his colors with saliva. On examination, Dr. Maury found that his mouth was full of secondary syphilitic lesions.

Hetero-inoculations of syphilitic blood, and of pieces of solid tissue, which of course contain blood, have been made experimentally by a number of physicians (Waller, the Anonymous Surgeon of the Palatinate, Pellizzari, Gibert). Some of the inoculations took; others yielded only negative results, showing that the intensity of the poison in blood is not particularly great. Pellizzari made five inoculations, of which only one took. Among the last three, which are the most celebrated, one subject of experiment was inoculated with warm blood, with positive result; the other two, Drs. Rossi and Passigli, were inoculated in the same way, at the same time, but the blood had become cold and was coagulated. The result in these two inoculations was negative.

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[1] Am. Journ. of Med. Sciences, January, 1877, p. 44.

Clinically, cases are encountered where blood seems to be the vehicle of contagion—where, for instance, a man acquires chancre, and confrontation fails to detect any physical lesion in the female, although perhaps here Morgan's theory of the contagiousness of vaginal mucus in syphilitic women may explain the infection.

The secretions from pathological lesions, not themselves syphilitic, although occurring upon the bodies of syphilitic persons, do not contain the virus of syphilis, unless admixed with blood. Gonorrhœa upon a syphilitic patient reproduces gonorrhœa by inoculation, and not syphilis; and the same is true of chancroid.

Vidal believes that urethritis upon a syphilitic person may produce syphilis by inoculation. Hill, Marsten, and Hammond incline to the same opinion. Tarnowsky,[1] in endeavoring to decide this point, made eighteen inoculations with blennorrhagic secretions from syphilitic upon healthy patients, and got one positive result. This result goes to prove that such discharges do not contain the syphilitic poison, for in one case in eighteen there surely might have been an admixture of blood with the inoculated secretion. In further explanation of the exceptional case may be advanced the well-known fact that urethritis may come on in a syphilitic person, due solely to the development of suppurating mucous tubercles within his urethra, and these tubercles may yield a discharge which resembles that of ordinary mild urethritis (blennorrhagia) in all respects. Such discharges will get well under anti-syphilitic treatment, as I have had personal occasion to observe, and such discharges certainly must contain the syphilitic virus as well as do the discharges of mucous patches situated elsewhere. If the discharges of urethritis are hetero-inoculable, producing syphilis, many wives would get the disease who now escape, and certainly more than one out of the eighteen cases of Tarnowsky ought to have yielded a positive result. Without concluding, then, that such discharges cannot be contagious, it is best to consider that more proof is required before accepting the fact as demonstrated.

Duplay's negative inoculation with pus from a pustule of acne produced upon a syphilitic patient, by iodide of potassium, is in point here.

Vaccinal syphilis perhaps yields the most convincing evidence that heterologous diseases upon a syphilitic person do not contain the poison in their secretions. It is well known in all epidemics of vaccinal syphilis, and there have been many, that all the children vaccinated from the vesicle upon the arm of a syphilitic child do not become poisoned, and, as a rule, that those first vaccinated escape (receiving the serum only), while the last comers get also some of the blood, and they develop both vaccinia and chancre at the inoculated spot. It has been demonstrated beyond question that pure, clean vaccine lymph, taken from a syphilitic person, is safe, and not poisoned with syphilitic virus, so long as admixture with blood has been avoided. The vaccine scab from a syphilitic person doubtless could not be used without great danger of inoculating syphilis, since the scab always contains a portion of the true skin of the patient from whom it comes. The epidemics of vaccinal syphilis should teach the physician never to use lymph taken from a child known or presumed to be syphilitic, for no amount of care can absolutely guarantee the absence of a trace of blood from the vaccine virus he has gathered.

Even at the present day epidemics of vaccinal syphilis are reported, and they are likely to continue. So late as Feb. 2, 1878, there appeared

[1] Vorträge über venerische Krankheiten. Berlin, 1872.

in the Italian Medical Gazette of Lombardy the history of twenty-six children vaccinated from one syphilitic vaccinifer, among whom fourteen acquired syphilis. In New York the question of the transmission of syphilis by the public vaccinators has several times been before the Health Board, and the possibility of such an accident is constantly coming up in the minds of fathers of children in private life.

Such experience as that published by Jonkoffsky,[1] where fifty-seven children (foundlings) were vaccinated with lymph taken from eleven children with inherited syphilis, without the transmission of syphilis in any case, can be set off by Hutchinson's[2] admirable report, in which ten out of twelve vaccinated got syphilis, the vaccinifer being a seemingly healthy child, who afterward was discovered to have inherited disease, although the mother seemed healthy at the time—as healthy as did the child.

Vaccinal syphilis frequently kills its victims, and there is no possible excuse for it in the present day. Pure vaccine virus can be obtained on quill and ivory points, taken directly from the calf, in most large cities in civilized countries, capable of transportation for a short distance; while vaccine lymph, in glass tubes, may be safely sent over the world and retain its powers, as may also the scabs from the calf.

It must be remembered that vaccination may call out latent syphilis, and produce an eruption upon a patient already syphilitic, just as a blister or other traumatism may do.

The secretions from tertiary lesions of syphilis, serpiginous ulcers, lesions of bone, etc., do not seem to retain any inoculable quality, so far as the transmission of syphilis is concerned. Diday's sixteen negative inoculations of blood, derived from patients with tertiary syphilis, seem to prove this, as well as the fact that a patient with tertiary lesions still upon him may occasionally acquire chancre anew, and run through a second mild course of true syphilis (p. 83). The one exceptional case quoted by Bumstead, of the Ohio surgeon who acquired syphilis by inoculating his finger while operating upon syphilitic disease of the bones of the skull, cannot overthrow the rule without more cases to confirm it, for there are so many accidental ways in which a surgeon, with an abrasion on his finger, may acquire syphilis in the exercise of his profession, that the great wonder is how any person escapes who handles the disease at all customarily.

Therefore, with tertiary syphilitic secretions, as with non-syphilitic pathological secretions upon syphilitic persons, it is well to reserve judgment for a time. They may possibly be capable of carrying the poison of syphilis without admixture of blood; but it has not yet been proven that they do so.

Of the physiological secretions it may be quite confidently affirmed that none of them are able to communicate syphilis by inoculation. Morgan's vaginal mucus seems to be an exception to this rule, but it is more than probable that none of the prostitutes in the Lock Hospital had a vagina so nearly healthy as to secrete only mucus; the discharge in every case must have been muco-pus, as, indeed, it was generally claimed to have been. The experiments, moreover, related more to the auto-inoculability of these secretions than to their poisonous, syphilitic character.

The tears, the urine, the saliva, the perspiration, the milk, the semen, have all been repeatedly inoculated without success. Very recently a dis-

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[1] St. Petersburger med. Zeitschrift, 1872. I. p. 73.
[2] London Lancet, April 7, 1873, quoting Med. Chir. Trans. Vol. LIV., 1871.

cussion has been raised upon the last two physiological secretions, regarding their power of transmitting syphilis.

Infection by milk.—Voss[1] reports a case where the injection of a Pravaz syringeful of milk from a syphilitic woman, under the skin of a healthy person, produced syphilis; but his conclusions are arrived at without just grounds. The report states that an abscess first occurred at the seat of the injection; then, after an incubation of forty days, a few papules (the alleged chancres) appeared around the seat of the abscess, and in five days (and this is the weak point, for no general eruption due to a chancre was ever known to appear within five days of the primary lesion) a general maculo-papular syphilide came out.

A single case can never constitute a rule in syphilis, for it is almost an impossibility to be certain to have eliminated all other sources of conceivable contagion, excepting the one under consideration.

Milk from syphilitic patients has already been several times injected under the skin, with negative result (Padova and Profeta).

Another case, published as one of transmission of the disease by syphilitic milk, deserves notice here. Cerasi[2] has reported that a child was given to an apparently healthy woman to nurse; that the child had no chancre at the mouth, and that the nipple remained unbroken; but that, in three months, the child became syphilitic, quickly developed general symptoms, and died in a convulsion. The autopsy revealed gummata in the brain and lungs, and an indurated liver. It now turned out that the nurse had had chancre two months before assuming charge of the child.

It seems paltry even to discuss such a case, for the child dies promptly with the lesions of inherited disease; the nurse has no symptoms except headache, rheumatic pains, and some pallor of complexion, while no reasons are given for supposing the father and mother of the child to be healthy.

None of these cases, therefore, can count against the investigations of other competent observers, and milk must still be considered incapable in itself of transmitting syphilis, either by inoculation or by ingestion, and must remain so until incontrovertible proof is adduced to the contrary.

The apparent infections by milk recorded by a number of observers are more than set off, as the matter now stands, by carefully observed cases, where children have suckled syphilitic nurses and remained sound, while inoculations of milk directly proves its lack of noxious quality. If the nursing syphilitic woman has a mucous patch, and the child a fissure on the lip, then the whole premises are changed, and chancre on the lip of the child is the natural result.

Zeissl believes that children do become infected by nursing syphilitic women, whose nipples and lips, in consequence of a mercurial course, show no signs of syphilis; but he does not state positively in what manner he believes the transmission of syphilis to occur in these cases.

The infectious quality of semen is a matter of very serious dispute, both as to its direct contagious properties and its capacity by impregnation to infect the offspring, the mother remaining healthy.

On the first point the recent experiments of Mireur[3] bear directly.

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[1] Petersb. med. Wochenschrift, No. 23, 1876.

[2] Gaz. di Roma, July, 1877, and Jahresbericht f. gesammten Med., Bd. II., Abt. II., 1878, p. 520.

[3] Annales de derm. et de syph. No. 6, Tome VIII., 1877.

With true French indifference to the means by which he arrived at his material for experiment, he inoculated four healthy individuals with semen obtained from a man of twenty-six years, in fresh secondary syphilis, who had not received any treatment. The subjects of experiment were long and carefully observed in each case, with negative result.

Such positive proof of the lack of contagious quality in the semen more than counterbalances the claim of Von Bärensprung, that semen may directly infect a woman, if she conceives at the time; or of Porter and Parker, that she may be poisoned through the semen alone, without conception, and without the receipt of any primary lesion on her part. The small size and ephemeral character often of the primary lesion in the female renders it necessary to accept the last part of this assertion with much reserve; and the evidence at best is only negative, for a little blood may very easily escape from an abrasion in the male, and carry the poison along with the semen. On the other hand, the mass of clinical evidence is enormous, going to show that men in full syphilis, but without local lesion, may have intercourse with impunity, and may even impregnate healthy women, and not transmit syphilis to them at all, or even to the offspring. That the semen, however, can transmit syphilis by inheritance seems to be pretty conclusively proved, as will be related farther on, but it certainly does not always do so.

TRANSMISSION OF SYPHILIS BY INHERITANCE.

In connection with the study of the virus of syphilis, and of the fluids which contain it and may transmit it, the question of transmission by inheritance naturally comes to mind, and calls for consideration in this its appropriate place. The question is a knotty one—and one, as yet, far from being solved to the satisfaction of the professional world.

In the sixteenth century, after syphilis became generally known, its transmission by inheritance was accepted. Afterward it was doubted. Hunter doubted that syphilis could be inherited. Ricord thought inheritance was rather the exception than the rule. During all this time there was a general belief prevalent in the profession that syphilis could descend to offspring, especially if the father were diseased; and finally, Vassal, and later, Cullerier, took the other view, and were the starting-point of that opinion which to-day embraces a very large and respectable following, namely: that the father's disease, or health, is a matter of no importance, so far as syphilis in the child is concerned, and that inherited syphilis cannot occur, except as a result of constitutional syphilis in the mother.

When both parents are diseased, the child is quite certain to be syphilitic, unless the poisonous quality of the malady in both parents, and especially in the mother, be pretty nearly exhausted. Cases have been recorded where the child appeared sound, in spite of disease in both parents; and all records dealing with this question refer to cases in which, the mother being diseased and producing a number of children, some of these suffer but little, if at all,[1] while others, born later, are manifestly syphilitic. This suggests the thought that during the lulls of disease, when the natural tissues of the mother seem to be healthy, perhaps the ovum may be free from the germ of the disease. It is certain that a

[1] Mireur, p. 91.

syphilitic woman under treatment may produce a child in all respects healthy, and then, giving up medicine under the idea that she is well, may give birth later to a child about whose syphilis there can be no doubt. One of Thurman's cases, quoted by Mireur,[1] is in point here. Both parents were syphilitic, both had apparently recovered under treatment, and neither of them showed any trace of syphilitic symptoms afterward, while they continued under Thurman's observation. Seven children were born to these parents successively, became covered with syphilitic eruptions, and died. In the eighth pregnancy, the mother was submitted to mercury. A healthy child was born, which remained well and grew up. In the ninth pregnancy, the treatment was continued, and the child was born healthy. In the tenth pregnancy, supposing herself well, treatment was neglected. The child appeared well at birth, but a syphilitic eruption came out later, and it died in six months. The mother finally became pregnant for the eleventh time. She again received mercury, and her child was born, and continued healthy.

That there are some unexpected peculiarities about the transmission of syphilis by inheritance, is certain. The theory that in certain cases the mother, by continuing to carry infected children, becomes by this means herself constantly more and more diseased, cannot be supported, because the examples proving it are altogether too exceptional to be reasoned from. It may seem to account for the fact that the older children are sometimes more diseased than the earlier ones born to the same syphilitic parents (as a matter of fact, this is exceptionally rare); but the rule remains that, in the vast majority of instances, syphilis exhausts itself by lapse of time in the mother, and her children become less and less diseased, and finally healthy.

When the woman alone is syphilitic, the child is quite certain to inherit the disease. The ovule itself is a part of the poisoned mother, and its development into an unhealthy child is a matter almost of necessity. Exceptions to this rule have been alluded to above, where the mother has syphilis, then produces a healthy child, then a syphilitic one. Most of these cases (Zeissl has several of them) can be explained away. Those which cannot, must either be accepted as a mystery yet unsolved, or ascribed to the fact that, during a lull in the disease, the impregnated ovule was and remained healthy throughout. Adam Owre, of Christiania, in a number of communications which have appeared of late years, contends hotly for, and adduces numbers of cases in support of Cullerier's proposition, that syphilis in the child is inherited from the mother alone. His last report covers forty-two syphilitic fathers having eighty-nine children. All the fathers were syphilitic, all the children were well, all the mothers remained healthy, all the cases were observed in private life.

Sturgis, of New York, has stoutly upheld this proposition; and J. W. Thompson says, in the Richmond and Louisville Medical Journal for February, 1876, that he has a list of seventy-two persons (adults and children) who themselves are sound and their mothers well, while he "positively" knows that all their fathers had syphilis. Mireur, in his pamphlet on the inheritance of syphilis, also takes this view. Two of Mireur's cases claim rehearsal here, for they demonstrate beyond the possible shadow of a doubt that a syphilitic father may produce a healthy child if the mother remains sound. One of the cases (p. 26) is this. C. has chancre and syphilis. In one year he marries. In ten months a healthy child is born, who con-

[1] Sur l'hérédité de la syphilis. Paris, 1867.

tinues well up to two years of age. Then the child acquires a chancre upon the lip from kissing its father, who has at the time an indolent erosion upon one of his lips, and in due time a roseola and mucous patches at the anus appear upon the child. In another case equally instructive, a syphilitic man impregnates his healthy wife and his syphilitic mistress at about the same time; both children come to term. The one born of the healthy wife has no disease; the illegitimate child, who is said to be the image of its father and whose mother is also syphilitic, is diseased.

When the father alone is syphilitic, the child unquestionably often escapes if the mother remains well. I have the most positive evidence of this in the cases of seven young men with twelve children: each father had syphilis, was treated by me throughout the disease, got married and had children under my observation, all in the city of New York. All the children and all the mothers are well. All the young men married before their symptom had entirely disappeared, all of them have had some slight but positive symptom of syphilis since marriage. Some of the children are under constant observation. All of them are occasionally seen. None of them have ever shown a sign of syphilis. A great number of other corroborative cases are constantly turning up under my observation, and there can be no reasonable doubt of the fact that a healthy woman, by a syphilitic man, may have a healthy child.

But that a healthy woman by a syphilitic man *must* have a healthy child, is altogether another question, and certainly is not a fact, if there is any value in evidence. Fränkel,[1] in examining placentæ, found fourteen which he believed to be syphilitic, in women who seemed healthy. The value of this observation, however, is more apparent than real, because many pathologists deny that the so-called syphilitic placenta is due to syphilis at all, of necessity.

Hutchinson and von Rosen are inclined to ascribe more power to the father than to the mother, in transmitting syphilis by inheritance. R. W. Taylor,[2] of New York (two cases), and J. N. Hyde,[3] of Chicago (three cases), Van Harlingen,[4] of Philadelphia (one case), have published very strong cases to show that the father alone, if syphilitic, can produce a diseased child, the mother remaining sound. Caspary,[5] Keyfel[6] (43 healthy mothers, 44 syphilitic children, the fathers being syphilitic), Diday[7] (26 cases), and many others, have recently come forward to sustain the proposition that the father alone, without disease in the mother, may transmit syphilis to the offspring.

The strongest of all the public documents sustaining this side of the question is the recent monograph by Kassowitz,[8] wherein the whole subject is submitted to an exhaustive study going to show, without leaving room for much doubt, that inherited syphilis in the child may descend from the father alone.

I have encountered, in what I believe to be a reasonably large experience, but one case sustaining this view, and that one was imperfectly observed. The case was that of a child dying shortly after birth with

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[1] Archiv f. Gynækologie, 1873, Vol. V., p. 45.
[2] Archives of Clinical Surgery, September, 1876.
[3] Archives of Dermatology, April, 1878, p. 103.
[4] Ibid., April, 1877, p. 211.
[5] Vierteljahresschrift f. Derm u. Syph., 4th Heft, 1875.
[6] Separat Abdruck aus dem ärtzl. Intelligenzbl., No. 21, 1876.
[7] Annales de dermatologie et de syphiligraphie, T. 8, No. 3, p. 161.
[8] Die Vererbung der Syphilis: Braumüller. Wien, 1876.

pemphigus and cachexia, where the autopsy showed syphilitic lesions in the lungs, liver, and other organs. The mother was apparently, and always had been, healthy, and so did the father appear to be; but the latter confessed, after a sharp examination, that he had had syphilis eight years before. The mother was not kept under observation long enough to give this case full value. The mother was a patient of Dr. C. C. Lee, of New York, who asked me to see the case with him.

It seems fair to accept as proved, therefore, that a syphilitic father may procreate a syphilitic child, and that, if the mother at the time of conception is healthy, she may remain so, or seem to remain so, indefinitely, the child being born syphilitic.

This statement leaves two very weak points unsatisfied by explanation. The points, both negative, are these: in no case, so far as I remember, has it been shown that a healthy mother, who had produced a syphilitic child diseased from its father, afterward became herself poisoned by experimental or accidental inoculation. The other point is this: Colles's law, so called, states that a child with inherited disease may poison a healthy stranger whom it suckles, by inoculating the breast; but that the same child cannot poison its mother. How this rule can possibly stand, unless the mother is already diseased, it is hard to conceive. And yet no authentic instance has been recorded in which, among the great number of cases observed, any exception to Colles's law has been noted. Brizio Cochi in 1858, and Müller in 1861, are quoted by Kassowitz as having reported exceptions to this law; but Kassowitz adds that the cases were not described with great accuracy or distinctness, and therefore, scientifically, they are of no value. Caspary[1] attempted the only possible positive solution to this question. He found a seemingly healthy woman with a syphilitic husband and a syphilitic child. *He inoculated the woman with the secretion of syphilis without effect*, thus seeming to prove that although apparently healthy, she already had syphilis.

I myself have one case bearing on this point. A woman has had under my observation three children, all syphilitic. Her husband was and remains syphilitic. The first child was a few months old when I first saw it. It was sent to me for treatment, with the statement that it had been born healthy, had been poisoned by its wet-nurse, and in time had poisoned its father. The child and the father were manifestly syphilitic. The mother thought she was sound, and would have passed for being well, except for a very thorough examination, which detected an occasional suspicious-looking macule upon the skin, and some small but beautifully characteristic mucous patches upon the throat and inside the mouth. All three were treated. The baby died. The mother lost her symptoms at once, and considered herself so well that she refused treatment; the father's symptoms continued and were severe.

After a time the wife again became pregnant in another city. A child was born apparently healthy. The mother was a picture of perfect health, and considered herself well. The father was still under treatment. The baby was pronounced healthy by the doctor in attendance, and given to a wet nurse. The nurse soon got a sore on the nipple, then a sore was found on the baby's mouth, and both nurse and child commenced to give evidences of syphilitic poison by eruptions. On this account the nurse was accused of having poisoned the child with syphilis, and was discharged. The child's mouth was treated, another nurse was sought, accepted the

[1] Vrtljhschrift f. Derm. u. Syph., 4th Heft, 1875.

place, and after a few weeks the family again came to New York. The mother seemed to be in the perfection of health, and no trace of syphilis existed upon her. The child, now about eight months old, looked like an old man; the head was small, the fontanelle nearly closed, the body wasted, the voice hoarse, while a large fungating ulcer occupied the corner of the mouth. The father had white patches on the tongue and squamous, serpiginous spots on the scrotum.

The new nurse was pale, had one raw, hard, beefy-looking ulcer on the nipple and breast about one inch long and half an inch wide. She was feverish, sore throat was commencing, with pains in the bones at night.

Nurse and baby were put under treatment. The former continued to have a few mild symptoms of syphilis while under observation (six months). The child's symptoms disappeared under treatment.

Finally, the mother became pregnant again. She seemed to be perfectly well, but I urged her to take treatment continuously through the term of utero-gestation. This she failed to do efficiently, because she enjoyed, seemingly, the absolute perfection of health and looked perfectly well. At the end of the eighth month, without cause, the child's movements in the womb ceased. At term, in February, 1879, she was delivered of a dead child, the macerated condition of the latter showing that it had been dead some time. In August, 1879, I saw the mother; she had taken no treatment, but showed no sign of syphilis.

This case is very instructive. Had I not seen the mother before the death of her first child, I should have felt certain that she had no syphilis, for, from that date until this writing, now a period of more than three years, she has not shown the least symptom of syphilis, except by the fact that she has produced two syphilitic children.

In summary of the foregoing statements, it seems just to conclude:

1. When both parents are syphilitic, the child is almost necessarily diseased. Exceptions are probable under treatment of the mother, or when lapse of time has exhausted the disease in the mother; exceptions are possible during lulls in the disease, or under circumstances with which science is at present unfamiliar.

2. When the mother is diseased and the father healthy, the child is syphilitic, excepting under the same circumstances as obtain when both parents are diseased.

3. When the father is diseased and the mother healthy, the child is healthy, as a rule. Sometimes the child is diseased under these circumstances, while the mother *seems to be and continues to remain well* in all respects, as testified to by a number of perfectly competent observers.

In connection with this question of the transmission of syphilis by inheritance, three other points must be considered, namely: the date at which a woman, carrying a child, may become syphilitic without poisoning the child; the "choc en-retour" of Ricord; and the transmission of syphilis to the third generation.

Date at which a pregnant woman may become syphilitic without poisoning her child.—Unless the mother, who has been healthy and carries a healthy child, gets a chancre before the seventh month of pregnancy, it is believed that her child will escape (Ricord, Boeck, Bärensprung, Fränkel, and others).

If the mother gets her chancre at the moment of conception, or soon after, she is apt to miscarry. If she gets it later, the child goes to term, but is born thoroughly poisoned, with poor chance of surviving. The

common agreement is that, if the chancre does not appear before the seventh month, the child is safe. This is not always the case, however, as proved by Chabalier's [1] case, in which chancre did not occur until the ninth month, due to intercourse at the end of the seventh month, with thirty-eight days' incubation. In this case the child had syphilis, of which it died.

Choc en-retour is a fanciful expression, meaning that a healthy woman conceives by a syphilitic man, that the ovum becomes diseased through impregnation with diseased semen and in its turn poisons the mother, the latter never having any chancre, but becoming directly contaminated by contact of her fluids with the infected fluids of the fœtus.

The possibility of choc en-retour reopens the whole question of the inheritance of syphilis from the father alone, already discussed above. The possibility of this method is seriously doubted by many, steadfastly believed in by others. It will stand or fall upon a final and definite solution of the question of inheritance from the father alone. If the father can transmit syphilis to his offspring by some quality his malady has imprinted upon his spermatozoa—and there is no reason to believe that this is absolutely impossible—then it is very probable that choc en-retour exists, and that the prolonged presence of the child in utero necessarily poisons the mother, without chancre, giving her perhaps a modified form of the disease—not enough poison to betray itself by the usual symptoms of syphilis, but enough to protect her from acquiring the disease afterward in a natural way, or by inoculation (Caspary), and preventing her child from giving her chancre of the breast, thus justifying Colles's law.

An occasional able essay upholding the possibility of choc en-retour appears. Diday [2] recently published such a paper, stating than an ovum, or an embryo, or a fœtus, poisoned by the father, might produce disease in the mother at any time before birth.

The transmission of syphilis to the third generation has generally been doubted. A common belief is, that after syphilis has been once transmitted by inheritance it degenerates into something like scrofula, which in its turn may be transmitted, although the syphilis may not. The truth seems to be, that the activity of the syphilitic poison is freshened up by transmission to a growing child. Infection of a healthy nurse by a diseased child is very common. Von Rinecker inoculated a healthy physician with pus taken from a pustule of acne upon a child forty-nine days old, whose syphilis was inherited.[3] Everything goes to show that the poison in a baby is exceedingly active, although that in the parents may have almost died out before the child is born. The reason syphilis is not generally transmitted to the third generation is, that if the quantity of poison in the child is great and the quality intense, the baby does not survive. If it is less powerful, the child overcomes it, throws it off, or, at least gets so far along in the tertiary stage before it has reached the age at which it can marry and have a child, that transmission to the third generation is very seldom encountered. I have a case now under observation in which I expect finally to prove transmission to the third generation; but the facts are not yet ripe for mature conclusions, and I withhold them. Hutchinson [4] believes he has seen one instance of transmission in the third gen-

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[1] Journ. de méd. de Lyon, May, 1864.
[2] Annales de dermatologie et de syphiligraphie. T. 8, No. 3, p. 161.
[3] Verhandlungen der phys. med. Gesellschft. in Würzburg. Vol. III., 1852, p. 391.
[4] Reynolds's System of Medicine. I., p. 100.

eration. Simon, in the debate on syphilis before the London Pathological Society in 1876, thought he had seen a case. Lewin[1] reports a case, and Atkinson, of Baltimore, another.[2]

Enough evidence from different quarters, therefore, seems to have been collected to decide that syphilis may be transmitted to the third generation.

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[1] Wien. med. Presse. No. 1, 1876.
[2] Archives of Dermatology, Jan., 1877, p. 106.

CHAPTER III.

SYPHILIS.

Methods of Contagion in Acquired Syphilis, Direct and Mediate.—The Duration of Syphilis and the Question of Marriage.—Cauterisatio Provocatoria.—The Prognosis of Syphilis, and the Influence of Constitution and of Intercurrent Physiological and Pathological Conditions upon its Course and Duration.—Second Attack of True Syphilis occurring in Individuals who have already once had Syphilis.

THE methods by which syphilis may be acquired are many. They have been foreshadowed in the last chapter during the consideration of the transmission of syphilis by inheritance, and of the fluids which contain the poison. On the methods of acquiring syphilis by inheritance, nothing more will be said; the present section deals with syphilis acquired by contagion.

Syphilis may be acquired by contact of a surface capable of absorption upon any part of the body with the poison of syphilis as contained in any of the fluids capable of holding it (Chapter II.), whether those fluids are at the time upon the body of the person yielding the poison, or upon some indifferent object. This opens the subject of direct and mediate contagion.

Direct contagion.—Syphilis acquired by sexual intercourse in the usual way is an instance of direct contagion. The surface capable of absorption upon the healthy person is brought into direct contact (usually) with the source of the poison. But there are many methods of direct contagion other than that by sexual intercourse; as illustrating these methods may be instanced: the chancre of the lip, acquired by kissing, a mucous patch being the source of the poison; the digital chancre of the surgeon, acquired while manipulating poisoned parts; or of the accoucheur, acquired while practising the vaginal touch; the chancre on the nipple of the healthy nurse, taken from the mucous patch in the mouth of the syphilitic child, and vice versa. Such examples might be multiplied indefinitely.

Mediate contagion.—Puche's often-quoted case is an excellent instance of mediate contagion, the healthy prepuce acting as the medium: A married man with a long prepuce has intercourse with a former mistress. He returns home unwashed, and repeats the sexual act with his wife, leaving in her vagina some syphilitic secretion which he had obtained from the mistress, and carried in the folds of his prepuce. The man escapes infection, but his wife acquires chancre. Spoons and forks, cups and tobacco-pipes, tattooing-needles (p. 64), are well-known media of contagion, receiving saliva which contains the secretions from mucous patches in the mouth, and depositing it upon a fissure int he lip of another person. All hetero-inoculations, for purposes of experiment or otherwise, are instances of mediate contagion. In the industry of

glass-blowing, the passage of the tube from mouth to mouth has been known to effect a widespread distribution of the poison. There are some grounds for believing that a new cigar may retain in an active state, at its twisted end, some of the syphilitic poison derived from the mouth of the man who originally rolled it—wetting the twisted end, as is often done, with saliva. Vaccination as a means of mediate contagion has already been noticed. Surgical instruments have sometimes been the medium of contagion. Hardy states[1] that, in 1876, a specialist in ear disease, in Paris, is believed to have inoculated thirty or forty persons with the Eustachian catheter. He (Hardy) had treated five of these. Wet cups have carried the disease, the transplantation of teeth has done the same, and the practice of the religious rite of circumcision.

A knowledge of the variety of methods by which syphilis may be conveyed is of great value to the patient, who is ordinarily ignorant of it. It is well to instruct him in this, as well as to give him directions about the local and general treatment of his disease, so that, while curing himself, he may know how to preserve those by whom he is surrounded from infection.

The duration of syphilis, and the question of marriage.—Zeissl is reported to have once made the statement that, if a man has syphilis once, he has it for ever, and that his ghost after death will still be syphilitic. Fournier has reported a case where a gummy tumor on the thigh appeared fifty-five years after chancre. In face of this strong assertion and this authentic case, each emanating from a gentleman occupying an authoritative position in the profession, who shall say that syphilis ever gets well, and not stand condemned by his own words?

And yet syphilis undoubtedly does get well. It is notorious that a patient while syphilitic cannot take the disease. Thousands of inoculations have been made upon such patients, by hosts of experimenters—especially by Boeck and the syphilizers—the matter inoculated being derived either from syphilitic secondary lesions or from syphilitic chancres. The result has been invariably one of two: either the inoculation has proved negative, or one of these two lesions has followed: (1) an abortive pustule or papule sometimes going on to ulceration, or (2) an ulcer yielding auto-inoculable pus, and considered by some to be a chancroid. In no instance, and at no stage of syphilis, has experimental inoculation of syphilitic virus upon an infected person been attended by the development of a fresh attack of syphilis, with its characteristic consecutive phenomena. Protection against future attacks is secured by a single infection; and yet there are a number of cases on record, resting on evidence which silences criticism, proving that true syphilis may be acquired twice by the same individual, and may in one lifetime run through its different stages twice (p. 83). It follows that the first syphilis must be well, or the second could not have been acquired.

The only flaw in this argument is that furnished by the facts that: (1) tertiary lesions are no longer contagious, and do not involve a persistence of the original poison as such, or at least not in its original state; and (2) occasionally patients still suffering tertiary lesions upon their persons bear healthy children. Therefore such persons, although still syphilitic, do not possess the active poison of syphilis, and therefore may take the disease again. Consequently it must be granted that there is no guarantee that the impress received by the organism upon the acquisition of

[1] Gaz. des hôp., Sept. 10, 1878, p. 833.

syphilis is ever totally eradicated, and that if the poison, as a poison, becomes exhausted by time, yet the possibility of after-outbreaks—if not virulent, at least due to syphilis—cannot be positively denied by any honest observer.

This statement at first sight seems to present a gloomy outlook for the patient, and to cast despair into the hopes of the physician in all his therapeutic efforts. But, practically, this is not the case. The treatment of syphilis is one of the few glories of medicine. It offers one of the very rare examples of the specific action of drugs. A close knowledge of its intricate workings and its myriad symptoms gives the physician a breadth of power over chronic disease, which he can acquire in no other way. When least expected, syphilis crops out as a cause of symptoms, which may have long baffled explanation, in a person whose character and surroundings place him above reproach. The multiple means of mediate contagion place syphilis within, not only the possibility, but almost the probability, of all mankind. The sanctity of virgin purity does not shield its possessor, the gray hairs of the sage do not protect him, the holy atmosphere of religion is no barrier, which syphilis by the aid of mediate contagion may not easily break down.

And yet, notwithstanding the widespread prevalence of the disease, it is usually a kindly enemy, and does not trouble its victims much at the present day, in the atmosphere of New York at least. Were it not for its treachery, it might be laughed at, but it is eminently respectable in its strength, and it sometimes exercises its power with a virulence which is appalling. It pervades the whole body, and may spring out when least expected, and its possessor has little safety, except in that comfort which a prolonged thorough treatment affords. No disease equal to syphilis, in obstinacy and virulence, yields a like ready response to treatment; and no condition, however seemingly hopeless, need excite despair, if only syphilis can be made out as a cause.

Practically, in the vast majority of instances, syphilis is a very mild disease. It gets well, to all intents, under a variety of treatments, or under no treatment at all very often; and the main advantage possessed by one treatment over another is the power which it may give of immediately controlling symptoms which directly threaten life, limb, or functions, and the guarantee afforded by experience in its use against relapse, or serious disease late in life.

It is a less serious matter to have syphilis than that one's father should have died of consumption or of cancer. Bad malaria, or dyspepsia, or rheumatism, or eczema, or psoriasis, or a number of other maladies, are infinitely worse than ordinary syphilis, far harder to manage, and much more likely to relapse. The danger and the severity of common syphilis is much overrated by the profession, as well as by the public. Bad syphilis is undoubtedly a horrible disease; but there is very little bad syphilis in the community, compared with the total number diseased.

Therefore, allowing that bad cases may continue to relapse almost indefinitely, and that some late lesion, due to syphilis, may occasionally appear after any treatment upon a patient once affected, even possibly up to the hour of his death, yet the common duration of the disease is only about two and a half to three years, and many cases do not have symptoms longer than during a few months. After the first year, or year and a half, there is generally but little trouble; and when the disease has fairly died away, the patient is as well as ever, and may go on to a ripe old age without ever again hearing of his enemy, having healthy children, and

passing through the changes incident to advancing life exactly like any one else.

The question of marriage links itself naturally to the question of the duration of syphilis. When may a syphilitic man marry? A man's life is not necessarily blighted by syphilis; and although the first impulse of a young man, upon acquiring the disease, is to forswear matrimony, yet he changes his mind after a time, and very justly so, when he finds that syphilis is not the horrible plague he had supposed it to be. The man who marries during the activity of syphilis commits a sin, the penalty of which is paid by his wife, his children, and society. In that penalty he shares, but he has no right to throw any of his burdens upon another, especially if he considers that other an object worthy of any regard. After the virulence of the disease has become exhausted, then a man may marry, and should marry, as discharging a duty due to society.

The time at which marriage becomes justifiable cannot be stated with absolute accuracy. In a general way it may be safely said that a man should not marry until at least three good years lie between him and his chancre, and at least one year has elapsed since the disappearance of the last symptom which can be ascribed to syphilis. Also, it is wise for a man not to marry until he has passed through a prolonged, mild mercurial course, and kept himself under observation for a number of months after all treatment has been suspended.

For a woman the time should be longer. She retains the power of producing diseased offspring much longer than the male; and, although syphilis in the female is commonly less intense than in the male, it is on that account none the less obstinate and protracted. It is hard to fix upon a proper date at which marriage may be allowed in the syphilitic female, but it is safe to say that at least five years from chancre, and a prolonged immunity from symptoms without treatment, should be insisted upon; that a previous prolonged mercurial course shall be an essential to obtaining the physician's consent to assume a share in the responsibility of marriage, and that in case of pregnancy the patient should submit herself to the mild action of mercury during the entire period of utero-gestation. With these precautions it will be reasonably safe for a syphilitic female to marry.

Cauterisatio provocatoria.—An attempt has recently been made by Tarnowsky[1] to find a test of the existence of syphilis, to apply to patients in whom the disease may be latent. He thinks that he has succeeded; but it will take many years to decide whether some of the patients, upon whom cauterisatio provocatoria produced only a negative result, may not yet develop symptoms due to syphilis.

The cauterisatio provocatoria is an application of the well-known principle that latent syphilis may be called into activity by the application of an external irritant. A blister, a vaccination, a traumatism, will sometimes call out symptoms of syphilis upon a patient apparently well, but really in a condition of latent syphilis.

At one time it was believed that a course of sulphur-bathing would bring out any remains of syphilis under which a patient might be suffering, and that if such a course left the skin sound a cure might be confidently affirmed. This, like all other previous tests, has proved fallacious.

Ricord's carbo-sulphuric paste was employed by Tarnowsky upon two hundred and fifty patients suffering from chronic maladies of the skin

[1] Vrtljahresschrift. f. Derm. u. Syph., IX.; Jahresbrcht. f. Gesmmt. Med., II. Bd., Abt. II., 1878, p. 525.

and internal organs. The result of its action is summed up in a number of conclusions, some of which are in substance as follows:

(1). A positive result proves that syphilis exists; a negative result does not prove the contrary.

(2). A positive result is the following: a dark red border, not disappearing on pressure, comes on after all inflammatory action produced by the cauterization has disappeared. This band is from three to five mm. broad. It has a sharp border, is indurated, grows slowly, and acquires a brown tint. After twenty to thirty days it gradually subsides.

At the same time, with the appearance of this border, a sharp-edged induration forms beneath the cauterized area. This increases for fifteen to twenty days, and then gradually disappears. If any one of the above detailed features is absent, the cauterization cannot be said to have produced a positive result.

Finally, around the cauterized area, after the cauterized tissue has separated, round or serpiginous ulcers, papules, ecthymatous pustules, or tubercles appear, which go far to make more certain the positive result of cauterisatio provocatoria.

(3). If the inflammatory results of the cauterization have not disappeared by the tenth to the fifteenth day, the first set of phenomena mentioned above cannot be observed, and the cauterization loses its diagnostic value. Prolonged inflammation is most apt to be observed in non-syphilitic, weakened, cachectic persons. A separation of the slough in the first five or ten days interferes with an accurate observation of the result of the cauterization, as does also the appearance about the focus of irritation of eczema, erysipelas, etc.

(4). The younger and the healthier the individual, and the less irritable his skin, the more accurate are the results which may be derived from a cauterisatio provocatoria.

(5, 6, 7). The nearer the date of chancre to the time of cauterization, the more likely is this test to give a positive result, and to call out symptoms of syphilis locally.

I have as yet no experience with this test. It can do no harm to try it, but it will be unwise to rely upon the results attained by it until its accuracy shall have been tested by a sufficient lapse of time, and at the hands of other observers. A reliable test of the termination of syphilis is very desirable. Koebner[1] has tried it. He says that Tarnowsky's effort is the revival of a similar attempt already undertaken by Meggenhofen. Koebner tried the cauterisatio provocatoria upon ten syphilitic individuals early and late in the disease. In two of the former the test was applied before any mercury had been given, but the result was negative. Indeed, Koebner failed to get any positive result, although four of his patients had had relapses of their syphilis at the date of his writing. Other investigators will doubtless soon be heard from. Still more recently Kaposi has tried this test. He denies its value.

The prognosis of syphilis, and the influence of constitution and of intercurrent physiological and pathological conditions upon its course and duration.—A solution of this question explains many of the apparent peculiarities of syphilis. If it were necessary to decide which single quality of syphilis was more certain to belong to the disease in all cases than any other, the quality of treachery would probably be selected. Uncertainty as to what the disease may eventually do

[1] Vierteljahresschrift f. Derm. u. Syph. H. IV., 1878, p. 589.

interferes seriously with accuracy of prognosis. I think I have demonstrated this in another place,[1] adducing cases to show that no amount of mildness in the appearance of the chancre, or the course or symptoms of early syphilis, is any guarantee that the future course of the disease will be equally light, no matter which of the treatments ordinarily in use is employed against the malady. The seven cases in the essay referred to are examples of the mildest forms of syphilis, treated in all known ways except by the prolonged mild use of mercury and by syphilization. I was unable to find a case where the mild, continuous treatment had been used, which commenced very mildly and yet terminated very severely; and syphilization is not practised in this country. Fournier's[2] record of forty-seven cases of cerebral syphilis lends further weight to the opinion that mildness of the early course of syphilis does not necessarily mean mildness throughout. Of Fournier's forty-seven cases, in only two did the syphilitic symptoms commence severely; one was moderately severe, thirty were ordinary cases, and fourteen were actually benign. The old notion, therefore, that a light beginning in syphilis can be counted upon to indicate a type of disease in itself necessarily mild, is not accurate. And yet, what else is there to judge from? Certainly, a severe phagedenic chancre is quite apt to portend a bad attack of syphilis. Diday's idea that the length of incubation of the chancre, and a long period of delay in the appearance of the secondary symptoms, portended a mild case of disease, is of some value, but certainly not absolutely trustworthy. As far as the first symptoms show anything, however, they do in a measure declare the character of the subsequent symptoms, but they do not guarantee it; the element of treachery steps in, and no honest prognosis can be a very positive one.

In a general way, then, with room for exceptions and leaving out for the present the question of personal constitutional peculiarities, it may be affirmed that a long incubation to the chancre, mildness in the primary lesion, a long secondary incubation, mildness in the earliest eruption (roseola)—such qualities in the early symptoms indicate a mild type of disease. Such a syphilis may run itself out in a few months, unaided even by any treatment, and may possibly never be heard from again. It often does appear in one form or another later in life, but commonly then shows the same light type as that in which it started.

On the other hand, a short incubation to the chancre, severity in its symptoms, or the duration of the latter, especially if the chancre be attacked by phagedæna, intensity in the local character of the first outbreaks (pustular instead of erythematous), and resistance of the latter to treatment—particularly that form of disease in which symptoms usually occurring in the tertiary stage come on early in the course of the malady (malignant syphilis)—all of these features in the beginning of syphilis indicate severity in the type of the disease, and the prognosis must be modified accordingly.

Something more must be said in relation to both these classes of cases—those commencing mildly, and those commencing severely. It often happens that cases mild in the quality of their symptoms are severe in regard to duration. Cases in which light scaly eruptions occur, and dry patches, with persistently relapsing mouth and throat lesions—these

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[1] Keyes: Treatment of Syphilis, etc. Trans. International Med. Congress, Philadelphia, 1877, p. 726.

[2] La syphilis cérébrale, etc. L'École de méd., Aug. 30, 1875.

often occasion great annoyance to the physician. No very severe symptoms occur at any time; but the persistent tendency of mild lesions to reappear annoys the sufferer greatly, by keeping his malady before his mind, and tests his patience to the utmost. In compensation it may be confidently asserted that many cases, seemingly very severe in the early stages, pertinaciously resisting treatment, running to ulceration, and bringing despair to the patient—such cases often expend their violence in the early part of the attack, and so exhaust the virulence of the disease in one or two years, that the patient never hears from it again, and passes through long years of after-life perfectly sound, bearing only the scars to indicate the ravages occasioned by his former enemy. This fact is undoubted, and a knowledge of it is often very comforting to the patient.

The influence of constitution upon the course and the type of syphilis is very obvious. Two persons infected from the same source do not have exactly the same type of disease. Both acquire identically the same poison, but the symptoms are quite certain to run a different course. This result can only be due to a difference in the constitution of the patient; and yet, the capriciousness of syphilis shows itself in this as in all other matters, and it is not safe to be too positive in basing a prognosis upon either the appearance of robust health or very obvious constitutional defects.

In a general way, it is true that a healthy person in good hygienic surroundings, living a regular life, is best able to stand an attack of syphilis, and ought to escape lightly; while a sickly person, in bad surroundings, should, by right, be overwhelmed by the disease. This is in a measure true, but exceptions are too common to make the fact of much value. A vigorous youth in the flower of health may wilt under the blight of syphilis, while a puny consumptive or a white-blooded dyspeptic suffers very little more while the disease is upon him than before he acquired it. It is this picturesque quality of syphilis which lends it such absorbing interest: the unknown element controls the issue, and a prognosis, to be honest, must always be guarded.

Despite all these exceptions, constitution does, on the whole, modify the course and intensity of the symptoms of syphilis. The rheumatic and the scrofulous tendencies are most obvious in their effects upon the symptoms of the disease. In the individual of so-called gouty habit, the evolution of the disease is slow, the type of eruptions dry and scaly, chronic, relapsing, often quite superficial. Many purely gouty eruptions, especially on the legs, resemble syphilitic eruptions so closely, that nothing short of the history of the patient and the result of treatment can positively establish a distinction between them. Pains and joint troubles, iritis, and bone disease, arterial complications leading to brain symptoms, are more to be expected in this class of patients than in any other; but perhaps the tenacity of life which these patients enjoy compensates in a measure for their greater tendency to certain forms of disease.

The condition of patients with phthisical tendencies is nearly always aggravated by an intercurrence of syphilis.

Scrofulous patients are quite certain to have syphilis badly. Not phthisical patients alone—for any one may have fibrous phthisis, whether he is scrofulous or not; but patients who are intensely lymphatic, who run readily into suppuration, ulceration, and pus-formation, who get white swelling of the knee, and hip-joint disease, and caries of the spine

from injuries, the effect of which would be readily thrown off by another. Patients of this class have moist vesicular and pustular lesions early in the disease, for the most part, and are prone to run early into ulcerative lesions.

Certain lymphatic glands are sometimes involved and remain indolently enlarged, or suppurate and communicate with the surface, remaining long open as ulcers in some of these cases. The character of the scrofulide is imprinted upon the syphilide, and the compound lesion goes through a slow evolution, and recovering, yields a compound scar bearing the characters of both lesions. Inveterate ulcers and destructive bone disease are apt to attend syphilis in patients of this class, and added to this is sometimes an intolerance of mercury, which interferes with treatment and complicates the situation.

Not only is syphilis influenced by other diatheses, but in return it influences other conditions. Many chronic maladies of the skin, as well as of the internal organs and tissues, when occurring upon a syphilitic patient, do better if to the treatment suitable to the disease is added a certain mild amount of anti-syphilitic medication. Syphilis influences the healing of fractures. I have had a case, and have personal knowledge of another, both in the thigh, where the fracture would not solidify until the patient had been put under the influence of large doses of the iodide of potassium, although in neither case at the time was the patient suffering from any obvious symptom of syphilis. H. L. Petit[1] has an analogous case quoted from Dron; and Zeissl, another quoted from Swediaur; Barnes, another in the London Lancet, for 1873. II., No. 18.

Sometimes ordinary wounds upon a syphilitic person fail to do well, and if irritated, assume the character of syphilitic ulcers (Petit,[2] Sturgis[3]); but this is exceptional rather than the rule.

As for the prognosis of syphilis relative to the question of transmission by inheritance, it may be confidently asserted that the malady wears itself gradually out, and that finally, in most instances, the patient becomes entirely capable of bringing healthy children into the world.

Prostrating and excessive work, irregular habits, excess of any kind, dissipation, bad hygiene, poor food, insufficient clothing, over-treatment (by excess of drugs), under-treatment (of too short duration), no treatment, bad treatment—all tend to aggravate the general prognosis.

Sex influences prognosis greatly. Women are more apt to become anæmic than men, and to grow greatly debilitated. Their symptoms are not nearly so characteristic of the disease as a rule, but the duration of syphilis with them, and the periods of latency, are seemingly longer. Pregnancy aggravates syphilitic symptoms temporarily. The power of transmission by inheritance is certainly longer retained by the female than by the male. The light character of the active symptoms of syphilis in the female makes it much easier for the physician to fail to detect the disease when present, and for the patient to ignore it when its activity has passed. It is dangerous, therefore, in a suspicious case, to decide that there is no syphilis in a female, simply because she denies its existence and bears no marks of its passage.

The age of a patient certainly influences prognosis. The activity of the disease is very great in babyhood, and young children very frequently

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[1] De la syphilis dans ses rapports avec le traumatisme. Brochure. Paris, 1875.
[2] Ibid.
[3] Relation of Syphilis to the Public Health. Pamphlet. New York, 1877.

die of syphilis, inherited or acquired. Old people, on the other hand, have less vitality and power of resisting disease, and syphilis acquired in advanced life is therefore often severe, but rarely directly fatal. Certain German authorities have denied this, and declare that syphilis acquired late in life is ordinarily a mild disease. I have not usually found it so.

Boeck, of Christiania, in his Researches on Syphilis, concludes that the average duration of life in syphilitics is less than in persons not so affected, and believes also that syphilis when acquired late in life is a less serious matter than it proves at a younger age. He thinks that syphilis acquired by infants is not often grave, and that the most malignant forms occur upon persons between the ages of twenty and thirty. In these conclusions, excepting possibly the first, Boeck is at variance with many other observers.

The truth is that syphilis is, in most cases, a very manageable disease, and prognosis is more influenced by the intelligence exercised in treating it than it is by all other circumstances combined; but there are occasional exceptions to this rule, as there are to all others relating to syphilis.

Reinfectio syphilitica.—Second attacks of true syphilis unquestionably do occur. This is not more strange than second attacks of other maladies, one course of which generally protects a patient for life, such as small-pox, scarlet fever, measles, vaccinia, etc. Zeissl,[1] in 1858, first called general attention to the fact that true syphilis may be acquired and run through its course twice, and since that time a host of other observers have brought forward cases to swell the list. Koebner[2] collated forty cases, Gascoyen[3] eleven, Caspary[4] three, and numbers of other observers one, two, and three cases. Diday[5] says that he personally saw twenty cases and he collected five others. He believes that generally the course of the second malady is very mild, although two among his twenty ran a severe course in the second attack. In both of these cases the interval between the two infections was nearly twenty years. In some of Diday's cases, when the second chancre appeared the patient still was suffering from tertiary symptoms remaining over from the last attack.

An attentive reading of most of these cases of so-called second infection makes it clear that there is no second attack at all, but that that form of pseudo-chancre exists (already described, p. 26) which is not at all uncommon, is really a small, solitary, ulcerated gumma of the penis, and is very frequently observed late in syphilis, even upon patients who do not practise sexual intercourse at all. Thus, in fourteen out of Diday's twenty-five cases, he states that there was an ulcer with characteristic induration, but that the inguinal glands did not become indurated, and no further sign of syphilis followed. Surely a mild syphilis this—certainly no fresh attack at all.

Several of Koebner's cases and of Gascoyen's also, are open to the same criticism as Diday's cases, so that second attacks of true syphilis are not so common after all. But second attacks certainly do occur. Hutchinson's case, observed in a physician, cannot be questioned; and many others equally convincing exist, where for a second time a patient has had an indurated chancre after a long period of incubation, followed by gan-

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[1] Lehrbuch der Syphilis, 2d ed., p. 58, 1872.
[2] Berliner klin. Wochenschrift, 46, 1872, p. 549.
[3] Med. Times and Gaz., Dec. 5, 1874.
[4] Deutsche med. Woch., and Vierteljahresschrift f. Derm. u. Syph., 1, 1876.
[5] Archives gén. de méd., July and August, 1863.

glionic engorgement, secondary eruptions, and lesions upon the mucous membranes passing through a course characteristic of syphilis. While, then, it must be granted that second attacks of true syphilis do really occur, although very exceptionally, it is fair to conclude that many of the reported cases of second attack are instances of one of the forms of pseudo-chancre, and not second attacks of syphilis at all.

The only reported case with which I am familiar, in which a person with inherited syphilis acquired syphilis again, is one reported by Hutchinson in his article on syphilis, in Reynolds's System of Medicine.

CHAPTER IV.

SYPHILIS.

The Incubation of Syphilis.—Description of Syphilitic Chancre: the Raw Erosion, the Superficial Ulcer, the Herpetiform Chancre, the Mixed Chancre, Chancre of the General Integument, Chancre of the Lip, of the Nipple, of the Urethra.—Syphilis without Chancre.—Typical Course of Chancre.—Specific Induration.—Complications of Chancre by Phagedæna.—Treatment of Chancre by Excision and other Means.—The Lymphangitis of Chancre.—The Bubo of Syphilis, and its Treatment.

The incubation of syphilis is that period of rest which always occurs between the absorption of the virus and the appearance of the chancre at the spot where absorption took place. Its average duration is twenty-one days, and it has been known to occupy nearly all the intermediate points between ten days (case of Lindmann) and fifty-six days (von Sigmund), one special case having been reported by Fournier where the incubation seems to have lasted for seventy-five days. Fournier quotes another from Guérin of seventy-one days.

This period of rest between the time of exposure and the time at which the disease shows itself is one of the peculiarities of maladies due to the absorption of a poison (small-pox, hydrophobia, scarlet fever) in which the blood becomes involved. It seems to require a certain time, after the poison has gained access to the absorbent lymphatics and veins, before it can ripen sufficiently to occasion even a local outbreak of disease. This local outbreak in syphilis always occurs at the point of entrance of the poison, and the disease continues, apparently, confined to this point for a period of so-called second incubation, after which its symptoms become generalized. How different is this course from that immediate local poisoning of the tissues found in chancroid!

The large number (nearly fifty) of well-recorded authentic cases of experimental inoculation of secretions capable of producing syphilis upon patients who were capable of taking the disease, has solved this question, and made the incubation period one of the most fixed of all the facts of syphilis. Confrontations have done as much to establish the period, and accurate clinical observation by skilled and reliable observers has finally confirmed the fact beyond dispute.

Why the time of incubation varies so much is not known. The shortest authentic case on record is that of Lindemann. He had been inoculating himself with chancroidal pus, and finally took some pus from an ulcer upon the tonsil of a syphilitic friend. The period of incubation of his chancre is put down as ten days; but the second incubation is placed at three months. This long second incubation makes it perfectly reasonable to explain away the exceptionally short first incubation in his case. Lindemann was, doubtless, capable of free and rapid secretion of pus.

That his skin did not become easily "syphilized," and incapable of producing pus upon inoculation with chancroidal secretions, is shown by his 2,700 successful inoculations upon himself of the pus of chancroid, as recorded by Fournier. Six to eight weeks is a very fair period of secondary incubation—longer than the average. Why may it not have been, then, that Lindemann, being in a pyogenic state, produced an ulcer upon his skin by inoculating pus from the tonsillar ulcer of his friend? And, supposing this similar to his previous self-inoculated chancroids, he simply records it as a take. The true syphilitic character of the sore may not have appeared until some days later—a feature which would have lengthened his primary incubation and shortened the secondary incubation, making both conform more nearly to the type.

Be this as it may, ten days may be well allowed as the shortest period of incubation. Clinically, cases have been reported near this date. I have seen a case where I believe the incubation to have been eleven (nearly twelve) days; although, in the great majority of instances, it has been the full three weeks, or more. The incubation in cases of experimental inoculation has very rarely gone over the month, and, in the greatest number, has lasted between three and four weeks.

During this period of rest, as a rule, absolutely nothing happens of which the patient is conscious. Sometimes an abrasion has occurred during sexual intercourse. This gets well in a few days, or it may ulcerate slightly; but, finally, everything clears up, and just as the patient (if his fears have been aroused) has begun to consider himself fairly safe, at the spot where poisoning occurred the primary lesion shows itself, and goes on to full development. Clinically, without confrontation, it is often difficult to establish the exact limits of the incubation period, on account of the promiscuous and repeated intercourse which the patient has indulged in.

Syphilitic chancre.—The initial lesion of syphilis is a chancre, which appears after a period of incubation upon the spot at which the poison was first absorbed. It occurs clinically, under a variety of forms which resemble each other very little. There is, indeed, nearly as great a variety in the local expression of primary syphilis as is known to be the case in secondary syphilis. The simplest method of giving a comprehensive view of these different primary lesions will be to describe in short detail a typical case of each variety, afterward treating the subject as a whole, and discussing the different variations from the true type, which may be encountered, and the occasional complications. Chancres, as encountered clinically upon the male and female genitals, are: (1) the raw erosion, more or less indurated; (2) the superficial ulcer, more or less indurated; (3) the deep, funnel-shaped ulcer, always indurated; (4) the herpetiform chancre, running into one of the above varieties; (5) the mixed chancre. The syphilitic chancres of the lip, of the nipple, of the general integument, also have their type-forms, and chancres of the urethra, anus, and rectum must be considered.

The raw erosion.—This is the most common form of syphilitic chancre. Most estimates place its occurrence as high as sixty to seventy-five per cent. of all forms. It is found in both sexes on the integument, as well as upon a mucous or semi-mucous surface, of variable size from that of a small split-pea to a large beefy patch as big as a copper penny. The surface may be in any shade of red. Occasionally it is of a light subdued pink. Generally the color approaches purple, passing through all shades of lividity. Sometimes in a large patch extravasated blood makes it more

dark, or even pigmentation in an old patch heightens the effect. There may be a central adherent false membrane (Clerc), but usually the surface is literally raw; not discharging pus, not ulcerated, but yielding a trifling discharge of bloody serum.

In shape this erosion is oval, or irregularly rounded; perhaps it may run along a natural fissure. Several may occasionally coexist upon one patient, appearing simultaneously. Induration of these erosions is common, less marked as a rule in the female, sometimes partial, sometimes beneath the whole surface, often parchment-like and imperceptible unless the whole integument at the seat of the erosion be lifted up, and the lesion gently pinched laterally between the thumb and finger. Sometimes, on the other hand, the induration is very prominent and bulges up above the surface like a solid tubercle, with a flat, raw top.

The superficial ulcer.—This form of primary lesion is very common, and is much like the last in most of its features. In fact, many chancres are first, erosions, then ulcerate superficially, and perhaps later return to the eroded state. The only difference between the chancre and the erosion is that this form is ulcerated. The ulcer is slight, its borders are adherent and sloping. Its underlying induration may be parchment-like, is more apt to be of split-pea variety, or there may be an elevated tubercle with a dome-like, ulcerated cap. Finally, the induration may be slightly excavated downward, and then the ulcerated surface is correspondingly depressed. The floor of these ulcers is grayish, the discharge scanty, thin, sero-purulent—perhaps bloody.

The Hunterian chancre, formerly looked upon as a type, is almost rare enough to be an exception. It is simply a very pronounced chancre of the variety last described, where the induration is considerable and the excavation proportionately great. This chancre is a large mass of woody induration, of rounded form, in the centre of which is an oval or rounded ulcer extending deeply into the induration, funnel-shaped, with a pultaceous floor, adherent sloping edges, and yielding a thin, moderate, puriform discharge.

The herpetiform chancre, so-called, is very exceptionally rare. In the few examples I have seen of it the period of incubation could not be satisfactorily determined. A single cluster of vesicles appeared upon the inner surface of the prepuce behind the corona. These looked and behaved at first precisely like similar attacks of herpes from which the patient had previously suffered, but the ultimate course was very different. The little ulcers of the cluster spread and ran together; induration appeared under the base of the ulcer, which became quite large; the inguinal glands tardily took on induration; and an attack of true syphilis followed in due course. I have been unable to overcome the conviction, impressed upon me by observing these cases, that herpetiform chancre is simply accidental herpes, upon the site of which, and before its ulcers have healed, syphilitic chancre comes out.

The mixed chancre of Rollet is a combination of the two sores, the chancroid and the syphilitic chancre. Each sore runs its course, and the compound lesion possesses the characters of both. The mixed chancre has been produced experimentally. The two cases of Lindwurm and Melchior Robert quoted by Rollet, show the characters of the mixed sore. Lindwurm inoculated one of a number of chancroids upon a female patient with the poison of syphilis. All the chancroids went on as usual, got nearly well, and the patient left the hospital. Later she returned. The one inoculated chancroid had broken out afresh, and had become

hard. It remained an ulcer long after the others got well, and was attended by an outbreak of general syphilis.

Robert inoculated a medical student with the secretion of a mixed sore. Auto-inoculable soft chancroid followed. When the first ulcer had nearly healed, it reulcerated, became hard at the base, and general syphilis followed.

A mixed chancre, then, may result from the inoculation of either sore upon the other, and its characters will be correspondingly modified according to the period of development of either sore; either one may be nearly well before the other gets fairly under way. If the compound poison is inoculated, the chancroid would naturally be well along in its course before it assumed any syphilitic features.

Inoculation of the secretion upon a healthy subject clinically may produce chancroid alone, or mixed sore, or, it is said [but this must be quite exceptional], chancre alone; just as vaccination from a syphilitic child may produce in the healthy one either vaccinia alone, or both vaccinia and chancre, or chancre alone. Clinically the mixed chancre is very rare.

Chancre of the general integument occurs as a flattened papule or elevated tubercle, or excoriated patch, or a moist, flat tubercle, or an indurated ulcer. All of these forms have been seen and studied in connection with experimental auto- and hetero-inoculations, and they may be encountered clinically. The lesions resemble the same varieties upon the penis. The excoriations are often in part or totally scabbed over; there may be nothing more than an insignificant, dry, scaling papule upon the skin to mark the point of entrance of syphilis. The flat, moist tubercle resembles exactly the condyloma—the flat, mucous tubercle of the skin. I have seen a number of them at a time upon the skin, as the initial lesion of syphilis—some dry, some moist, some scaling, all livid, raised, flat, and none of them markedly indurated. Finally, a superficial or a deep excavated ulcer may mark the starting-point of syphilis upon the skin, and in such case the induration of the ulcer is apt to be quite extensive.

Chancre of the lip is generally a globular mass of induration as large as a marble, with an excoriated or exulcerated surface. I have seen two lesions of this sort, both upon young girls, both acquired innocently from a lover's kiss. The only other case I have seen was on the lip of an old Frenchman. The chancre in this case was a deep ulcer, acquired by smoking the pipe of a companion. It was large, oval, ragged, and much indurated.

Chancre of the nipple, acquired by nursing a syphilitic child, may be a large, deep, indurated ulcer, a brawny excavation, an excoriated or ulcerated, indurated fissure, or a flat, mucous papule more or less livid, moist, or dry, scaly or scabbed, sometimes but little indurated. I have reported[1] a case where the last-named lesion occurred in a multiple form. Both nipples were involved, four chancres being on one side, eight on the other. Fournier[2] has published one case with seven on one nipple, and sixteen on the other, and another case of extensive phagedenic chancre of the nipple derived from contact with a mucous patch. The mother of a child with inherited syphilis, although she may never have shown any symptom of having had syphilis, cannot acquire chancre at

[1] Archives of Dermatology, April, 1878, p. 126.
[2] Gaz. des hôp., Dec. 1, 1877, p. 1109.

the nipple by suckling her own child with mucous patches in its mouth (Colles's law).

Urethral chancre.—I have observed two cases of urethral chancre, one of them through the endoscope. By the tube of this instrument the inside of the urethra may be inspected, and the round flat ulcer seen. Generally, urethral chancre is situated just within the meatus, one of the lips of which it may involve. Occasionally, however, it occurs at a considerable distance within the canal. In my own case[1] the ulcer was situated upon the roof of the urethra, one and one-quarter inch from the meatus. By exactly what mechanism the virus reaches such a deep position, it is not easy to imagine.

Generally, urethral chancre discloses its existence by the presence of a lump along the course of the urethra, usually painful upon erection. At this spot some pain is apt to be complained of on urinating. A slight discharge flows from the urethra, more mucoid than purulent, sometimes bloody. This discharge commences at a considerable interval after the sexual contact to which it was due. The slight discharge continues for a number of weeks, and the scar left by the chancre may subsequently occasion more or less stricture of the urethra. The inguinal ganglia are indolently enlarged and indurated.

Syphilis without chancre does not exist, except as acquired by inheritance, and possibly by mothers in the so-called choc en-retour process. Under all other circumstances syphilis commences with some sort of a lesion at the point of entry of the poison. Since concealed chancres have been better understood, and the specific character of the enlargement of the lymphatic ganglia in the neighborhood of the primary lesion more closely studied, it is easier to get upon the track of a chancre than it was formerly. Chancres are known to occur at the orifice of the Eustachian tube (by inoculation), upon the finger, in unexpected places, deep in the vagina, in the rectum, in the urethra; they have been observed in all these situations, and spontaneous syphilis (without chancre) is much less talked about now than formerly.

The course of typical syphilitic chancre, uncomplicated, is about as follows: The first sign of a positive result of an inoculation of syphilitic virus upon the skin of a healthy subject is a flat, dry redness, or a raised, hard papule, red on top. Generally, upon a mucous membrane, an excoriation or a small superficial ulcer is found from the start. Sometimes a mass of induration forms first, and this afterward excoriates or ulcerates. On a mucous membrane a vesicle or a pustule may precede the shedding of the cuticle which leads to the excoriation, but its existence is ephemeral; it is usually only an epiphenomenon. Induration of the base may precede the breakage of the cuticle, and be excessive as compared to the latter; or the opposite condition may obtain, there being considerable ulceration after matters have progressed for a time, and very little hardness. Exceptionally, the whole prepuce becomes stiffened with a cartilaginous induration. An acute erysipelatous flush of the integument may precede this induration, or the latter may form gradually, especially if the chancre involve the prepuce near the frenum.

In the female, around the ostium vaginæ and on the labia, erosions, often not appreciably indurated, excoriations, flat, raised mucous tubercles, and the regular deep indurated ulcer, may each be encountered as the herald of future syphilis.

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[1] Am. Journ. of Dermatology and Syphilography, 1871, p. 37.

The erosion or ulcer increases in size for a varying period and to a varying extent; from an erosion, through irritation, it often becomes an ulcer. It remains unique, not poisoning the integument in the neighborhood, and not giving any pain; yielding its watery discharge, attended by its lymphangitis and its adenitis in the second week, and, after lasting from two or three weeks to as many months, it finally gets well, leaving no trace in most instances. If the ulcer, however, has eaten through the papillary layer of the skin, if it has been phagedenic at all, then a scar is left, proportionate in extent to the amount of tissue destroyed. These scars often remain indurated for a considerable period. They are not customarily pigmented.

Auto- and hetero-inoculation of a syphilitic chancre are both possible.—So much has already been said upon this subject, in Part I., Chapter III., that only a few words more are necessary. These few words may be concisely arranged in the form of separate propositions, the truth of which seems undoubted, in consideration of the experimental and clinical evidence upon which they are based.

(1.) Hetero-inoculation of the watery discharge of an unirritated chancre upon a healthy person produces only a syphilitic chancre after a period of incubation, and the patient becomes syphilitic.

(2). Hetero-inoculation of pus, taken from a suppurating, ulcerated, or irritated (Lee, Boeck) syphilitic chancre, upon a healthy person, produces often an abortive pustule which gets well, and, after the natural incubation, syphilitic chancre at the same spot follows. If the person be in a pyogenic condition the first abortive pustule may ulcerate, and the pus from this first ulcer may be auto-inoculable through a few generations (Daniellsen's case).

(3). Hetero-inoculation of pus from a suppurating, irritated, syphilitic chancre, upon a person already syphilitic, generally produces an ulcer quite freely auto-inoculable in generations, and much resembling chancroid (Boeck). Inoculation of pus from this lesion upon a healthy person has produced an ulcer, in one case at least, which was auto-inoculable and not followed by syphilis. An explanation of this occurrence has been offered in Chapter I., Part I., p. 4.

(4). Auto-inoculation of pus from a suppurating chancre acts exactly like hetero-inoculation upon a syphilitic subject, the extent of the ulcers and amount of the suppuration being dependent upon the pus-forming tendencies of the individual.

(5). Auto-inoculation of the watery discharge from an unirritated syphilitic chancre is absolutely negative, excepting under two circumstances:

(a). When the chancre is quite young, and the organism presumably not saturated with syphilis, some of the poison taken from the patient's own chancre may be successfully auto-inoculated, producing a second characteristic chancre upon him (Puche, Wallace, Sperino, Bidenkap, Lee, and others). This is no more than was to be expected; for multiple hetero-inoculation by scarification produces a number of simultaneous chancres, and the same phenomenon is observed clinically, as in multiple chancre of the nipple. Until the whole organism is saturated with syphilis, both hetero- and auto-inoculation with the pure virus, unmixed with pus, may produce another chancre with all the features of a true syphilitic primary lesion.

(b). Patients with a syphilitic eruption often have a lesion produced at a point which has been subjected to local injury. A burn, friction, or *irritation,* will call out a papule or tubercle, evidently syphilitic, which

may dry up and scale, or may excoriate and ulcerate ; and this lesion may very closely resemble true chancre. This result has been produced by Wallace experimentally, the virus from chancre being auto-inoculated upon a patient in the eruptive stage.

Vaccine auto-inoculation offers an analogy to this seeming anomaly: any number of simultaneous inoculations take, and auto-inoculations, while the vesicles are yet young, give a positive result. Finally, when the protection wears out, as it often does, reinfection is possible : the name being changed, the story may be told of the disease we are discussing.

The specific syphilitic induration is a feature of chancre the importance of which has been much overrated. It is not an absolute essential of syphilitic chancre to be indurated, although, unquestionably, it is a very constant symptom. Induration occurs in three forms:

(1). The most common is the parchment-like induration found underlying an ulcer or an erosion, and often appreciated with difficulty, unless the ulcer be pinched up laterally between the thumb and finger. This variety of induration is common in the female ; it is rarely simulated in other forms of disease; it does not involve the subcutaneous tissues, and may be so filmy in character as to require considerable faith to find it.

(2). The next form is characteristic, but not very common. It is called the split-pea induration. Immediately underlying the ulcer is a substance of cartilaginous or woody hardness, like a split-pea, convexity downward. Its size varies with the size of the surface lesion. It is very nearly, indeed often absolutely, insensitive to moderate pressure. It does not shade off into the tissues around it. It is not adherent to the deep fascia, but it ends abruptly in all directions, and is as cleanly defined as would be a foreign body set into the skin attached to the ulcer by its upper surface.

(3). The last form of induration is excessive. It resembles the split variety in its quality and behavior as to the surrounding tissues, but it may greatly surpass the limits of the surface lesion, be convex or concave on its surface, or involve irregular areas of skin, as when the whole prepuce or a portion of it is involved in a wood-like hardness in connection with chancre.

Induration often precedes the breakage of the skin, and very often, where it has been excessive, outlasts the healing of the ulcer, continuing perhaps for several months, or in the scar for years. It may be of only short duration—ten or twelve days, coming late and going early. The thin, parchment-like induration is the most transitory. Once commencing to disappear, induration may relapse, and occasionally outstanding indurations appear in the neighborhood not connected with the initial lesion, but formed around the lymphatic vessels, and these indurations may possibly ulcerate (Fournier).

Phagedæna destroys induration.

Something like any of the above forms of induration may appear with other lesions than chancre, and, indeed, upon persons not at all syphilitic. It is never safe to depend upon this sign for a diagnosis. It is most valuable as a corroborative symptom, and more constant, as a symptom of syphilitic chancre, than any other one symptom, except the length of the period of incubation; and this latter may be unattainable. Ordinary inflammatory induration, generally, is very different from specific induration. It is red on the surface, painfully sensitive to pressure, adherent to the skin and the parts beneath, losing itself gradually in the subcutaneous tissue, with no clearly defined edge; yet, in spite of all the differential

characters, syphilitic induration may be so closely simulated by a non-syphilitic lesion, that, alone and without strong corroborative evidence, it is not of enough value to establish a diagnosis of syphilis.

The induration of a small gumma of the semi-mucous membrane of the prepuce, as appreciated by the finger, is sometimes absolutely, and in all respects, a typical induration as found in the best-marked cases of syphilitic chancre.

The complication of syphilitic chancre by phagedæna.—Syphilitic chancre is rarely complicated. Vegetations may grow up around it and its new surface may granulate, or may take on a whitish pellicle and become transformed into a mucous patch. Some amount of inflammatory disturbance may complicate the ordinarily indolent and undemonstrative chancre, leading to its swelling, pain, suppuration, and giving to it some of the features (auto-inoculability) of its more formidable local rival, chancroid. All of these complications need but to be mentioned to be understood. The rarer complication of chancre with chancroid has been described at p. 87 in (mixed chancre).

Phagedæna complicating syphilitic chancre occurs usually in the gangrenous form. If the whole base of the sore is involved, the induration disappears in the phagedenic process. Sometimes the slower form of phagedæna is found, but generally this variety is not very extensive, when complicating a syphilitic primary lesion. A description of both forms of phagedæna has already been given at p. 39, in connection with chancroid, and nothing further need be added here except an allusion to the fact that mercury internally, although harmful to phagedæna occurring upon the patient who is not syphilitic, is decidedly beneficial to the phagedæna attacking syphilitic chancre.

Bassereau puts the relative frequency of phagedæna as encountered with syphilitic chancre at fourteen per. cent., and Fournier makes it about the same. It is generally believed that a phagedenic chancre portends a bad type of syphilis, and this is doubtless so, since phagedæna is not a quality of the peculiar virus with which the patient has been poisoned. The phagedæna is due to the patient's own quality of constitution, and it is fair to suppose that such a constitution will suffer from an attack of syphilis more seriously than another. A phagedenic chancre owes its origin to an uncomplicated sore as a rule, and does not transmit phagedæna to another person.

TREATMENT OF SYPHILITIC CHANCRE.

Clerc's medical student, who washed himself after intercourse, found no lesion for several days, and yet had chancre after twenty-eight days' incubation; Diday's case of cure of a syphilitic chancre six hours after its appearance, by applying caustic, where, in spite of the healing of the sore, general syphilis followed; and Hill's [1] very striking case, in which he cauterized, with nitric acid, a torn frenum within twelve hours after intercourse, destroying the raw surface, but not destroying the virus, which showed itself at the cauterized point a month later, as a syphilitic induration, followed by secondary symptoms—all of these cases go to prove that when once the poison has had access to the absorbents, the patient from that moment has syphilis several weeks before he has any chancre at all. The folly, therefore, and the uselessness, of paining a patient

[1] On Venereal Diseases. London, 1868, p. 67.

with caustics or of mutilating him with a knife, appears obvious; yet the subject is still under active discussion, and the last word has not been spoken.

It is well known that cauterization will sometimes cure a syphilitic chancre. Caustic does not do away with the induration, however, and the latter may reulcerate after cicatrization. No claim can be substantiated which demonstrates that burning a syphilitic chancre is of any value to the patient, and therefore this plan of treatment has been practically abandoned by the profession. A few still practise it, but they belong to that extraordinary type of practitioner who burns every venereal sore he encounters, and gives mercury at the same time, so as to feel pretty certain to hit right, to whichever variety of ulcer the sore happens to belong. He treats the symptom and the possibilities, letting the diagnosis take care of itself.

The excision of syphilitic chancres.—The plan of treatment which is exciting most interest at the present day is an attempt at the radical cure of syphilis by excision of the chancre. The possibility of effecting cure in this manner is based upon the theory that the poison, after being absorbed, lies latent locally throughout the period of incubation, and then commences to increase in quantity, at first only locally. After a period it reaches the lymphatic glands, and there increases and multiplies again, remaining local in its new position, until, during the period of secondary incubation, it has had time to infect the general system, after which it becomes general and manifests itself by an eruption. This theory is not sustained by analogy. Other poisons absorbed into the body seem to become diffused very promptly through the blood.

The most thorough essay upon the subject of excision of the primary lesion of syphilis which has appeared, has been published by Auspitz.[1] Numerous attempts to cure syphilis by excising the primary lesion had already been made by Meyer, 1840; Hueter, 1867; Ulrich, Coulson, Langenbeck, Thiry, and Vogt, some deciding for, some against, the value of the method. Auspitz reports thirty-three excisions, and, after excluding ten for various reasons, founds his belief upon what he claims to be the results in the remaining twenty-three. Out of these twenty-three he reports that fourteen remained free from syphilis. Therefore Auspitz concludes that the proper treatment of chancre is to cut it out carefully, removing all the tissues involved in the induration, and those immediately around. He further believes that, even after the inguinal glands have become indurated, excision of the chancre alone may effect a cure, although the glands are left undisturbed; and finally he states as his opinion that, even if a cure be not effected, the course of the subsequent syphilis is rendered more mild by the excision of the primary lesion.

These last statements seem particularly extraordinary, but in fact the whole essay is unsatisfactory upon close analysis. In the first place, Auspitz is well known to be a unicist. He does not believe that there are two poisons, one of which produces exclusively chancroid, and the other syphilis. It is not stated for his twenty-three cases that confrontation was used in them to substantiate the diagnosis of syphilis. The diagnosis of syphilitic chancre was based solely upon the "initial sclerosis," as he calls it—a sign full of the possibilities of error; and, if the histories report the cases accurately, several of them seem unquestionably to have been simple chancroids with hard, inflamed bases. The period of incubation

[1] Vierteljahresschrift f. Derm. u. Syph., IV., 1877, 1 and 2, p. 101.

was unknown in nine cases, or set down as *less than ten days;* and several of the cases were only observed a few months after excision—a period manifestly too short to make it safe to decide that no syphilis was present. Altogether the report is full of inaccuracies, and, although in several of the cases the date of apparent incubation and the appearance of the chancre make it seem very probable that the patient had syphilis, while no symptoms followed excision, yet the possibility of error was not guarded against by confrontation, and the cases at best remain simply as negative evidence, while the nine positive cases, in which syphilitic symptoms followed in spite of excision of the chancre, are not explained away by Auspitz.

Still more recently, Kölliker[1] has communicated eight cases of excision of chancre for the prevention of syphilis. Of the eight, five had syphilitic symptoms in spite of the excision; three remained free. In none of the three was confrontation employed to establish the diagnosis. One of them was observed less than four, the other two less than five months. In Case V. the chancre was excised seven days after it appeared; there was no glandular swelling at the time, yet syphilis followed. In Case VIII. excision was practised ten days after the chancre appeared; there was an enlarged inguinal gland (only one, it seems) on the right side at the time, and syphilis did not follow. In one (successful?) case the chancre had existed two weeks; but there was no ganglionic enlargement in the groin, a circumstance which opens the nature of the chancre to question.

Three cases have since been reported by Unna, in one of which syphilis followed. The cases teach nothing new.

Hence it may seem that the matter is not yet proved. Doubtless many experimenters are now at work investigating the subject. The most certain demonstration would be for some gentleman, who had never had syphilis and who believed in the value of excision, to allow himself to be inoculated from an initial lesion upon another. If this inoculation was followed by the proper interval of incubation, and then appeared as a hard papule, the latter might be cut out and the result watched.

Up to this time, all that can be said in the present state of the question is, that cutting out the initial lesion of syphilis can do no harm, and may do some good. It should be placed before the patient in this light, and, if he elects excision and the chancre is in a suitable position for thorough removal, it may be excised, precautions being taken first thoroughly to disinfect the surface with carbolic acid, to use clean curved scissors and hooked forceps, and to remove all the induration, and a certain portion of healthy tissue, at a single cut. The after-dressing is unimportant. The general excision of syphilitic chancres is yet to be justified, or condemned, by the result of experiments.

At present the best local treatment for chancre seems to be black wash, or dusting with calomel powder. In suppurating chancres iodoform is serviceable. The mixed sore must be treated like a chancroid. Phagedæna attacking a true syphilitic chancre is favorably influenced by the internal use of mercury. If the sore is not syphilitic, mercury is harmful.

The internal use of mercury has a very favorable influence in shortening the duration of a syphilitic chancre; but such treatment is hardly ever

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[1] Ueber Excision der syphilitischen Initialsklerose. Centralblatt f. Chirurgie, Nov. 30, 1878, p. 801.

advisable—never unless the origin of the sore has been ascertained by confrontation, and all the points about the ulcer, its history, and its physical characters, render it beyond possible doubt that its nature is syphilitic; and even then, unless there is some excellent reason to the contrary, it is better to wait for the first signs of general syphilis before commencing treatment.

THE LYMPHANGITIS OF SYPHILIS.

This consists in an indolent thickening, with induration of the wall of one or more lymphatic trunks. The thickening involves a certain amount of the surrounding atmosphere of connective tissue occasionally. These rigid cords with occasional knots upon them may be felt along the sides or back of the penis, sometimes part way from the chancre backward toward the root of the penis, sometimes only perceptible near the pubic symphysis. The cords vary in size with the amount of infiltration of the walls of the lymphatic trunks, and are larger, if any surrounding tissue happens to be involved. Very rarely the inflammatory process around the vessels goes on to suppuration. Generally, the lymphangitis, if it occurs, precedes the inguinal adenitis by a few days. Rollet thinks it may be found, if looked for, in almost twenty per cent. of all cases. It is, as a rule, painless, and of not the least importance. It requires no treatment. The integument over the thickened lymphatic trunks is not reddened. There is no peculiar character by which this malady may be known from a chronic mild lymphangitis of the larger lymphatic channels occurring spontaneously, and having no connection with syphilis as a cause. I have encountered this twice upon healthy persons, and seen it occur in connection with non-syphilitic lesions. All that can be said of syphilitic lymphangitis is, that if it occurs with syphilitic (uninflamed) chancre, it is very certain to be peculiarly indolent and painless, and to be characterized by a high degree of induration. Anatomically the walls of the lymphatic channels are permeated with exudation corpuscles. Syphilitic lymphangitis requires no treatment.

THE BUBO OF SYPHILIS.

The first set of lymphatic glands along the line of absorbents which originate in the neighborhood of the initial lesion of syphilis, almost invariably become the seat of certain changes which stamp them with peculiar value as aids to the diagnosis of the nature of the primary lesion. The bubo of syphilis may therefore be situated anywhere upon the body where there is a lymphatic gland, provided the radicals of the lymphatic trunks leading to that gland originate in the neighborhood of the chancre. Thus, chancre of the lip has its bubo under the jaw; chancre high up on the cheek, in the pre-aural gland; of the hand, in the epitrochlear gland; of the breast, in the axilla; of the penis, in the groin, etc.

The syphilitic bubo almost invariably comes on during the second week after the appearance of the primary lesion, between the eighth and eleventh days in cases of experimental inoculation. One gland generally first becomes enlarged, and then a number of others, until (in the groin) a cluster of altered glands, not matted together, but lying separately, are found, constituting what Ricord has termed a pleiad, and, when typical, very distinctive of syphilis.

The number of glands in a pleiad varies from two or three to six or eight. Where there are many, one is usually larger than the others. Generally the glands in both groins are involved. Each of the little glands of the altered group is quite hard, round or oval, painless on pressure, not adherent to the skin or to the tissues lying under or around it, and each is entirely distinct from the others. The skin lying over them is not reddened, and the patient is unconscious of their existence. In size each gland varies from that of a pea to that of a marble. Where the number is considerable, the size of each is usually smaller than where there are but few. Occasionally, instead of the pleiad there is one very large, hard, oval gland, with one or two quite small ones; and still more rarely the bubo is single; an enormous lump as large as an egg, existing in one or both groins. Bassereau dissected one of these lumps, and found it composed of a mass of indurated connective tissue enveloping a number of indolently engorged glands of different sizes, between which ran the thickened lymphatic trunks.

The swelling of these glands is called indolent because of their slow course, their painless and non-inflammatory character. Very often, however, when they begin to swell they are slightly painful; and occasionally they go on to suppuration, either centrally, or as a peri-glandular suppuration. Such abscess is always simple in its nature, and, if open, never becomes chancroidal like the virulent bubo of chancroid.

While the syphilitic bubo is generally multiple, in certain situations it is more apt to be single, as under the chin, under the jaw, at the elbow, although in the latter situation there may be a secondary pleiad in the axilla.

According to Rindfleisch, the ganglionic induration is due to an increase in the cellular elements of the gland, more than to a thickening of the parenchyma. These new cells undergo fatty metamorphosis after a time, and are absorbed.

In very fat people syphilitic bubo is less marked than in others. In about two per cent. of all cases examined Fournier found it entirely absent. He thinks that it may be absent when phagedæna attacks a chancre. The duration of syphilitic bubo varies from a few weeks to a number of months. Sometimes the glands never subside to their original size. They are almost constantly present during the first eruption, and at this time they occasionally grow somewhat larger and harder.

Certain observations have been made (Fournier) tending to show that other groups of lymphatic glands, lying more centrally than those first involved, become secondarily the seat of indolent engorgement, at an interval after the enlargement of the first set of glands. Attention has only lately been drawn in this direction, and the question is not yet fully solved. Clinically it is not a matter of much importance, since such sets of glands are generally beyond the reach of inspection. This is not always the case, however, for in mammary chancre it is customary, first, for a few glands underlying the pectoralis, on the chest, to become indurated, and then the axillary glands; and it is not uncommon, after a digital chancre, for the epitrochlear glandular enlargement to be followed by multiple indolent bubo of the axilla.

The treatment of syphilitic bubo is that of general syphilis. No treatment is called for until a general eruption comes on. Local measures are useless. If pain and inflammation appear as complications, the symptoms are to be appropriately met.

CHAPTER V.

SYPHILIS.

A Table giving a Comprehensive View of the Features, Course, Symptoms, etc., of Chancroid, as compared with Similar Conditions, when met with in connection with Syphilitic Chancre.—The Stages of Syphilis: Primary, Secondary, Tertiary.—Malignant Syphilis.—The Second Incubation.—Syphilitic Fever.—Symptoms attending the Beginning of General Syphilis.

A DIAGNOSTIC table, setting forth the main differential points of chancroid and chancre in typical cases, has already been given at p. 25. The present table is inserted as a summary, and is intended to present a condensation of the whole subject for easy reference. This table will not serve as a diagnostic table. A diagnosis, with any chance of being accurate, can only be rendered about a typical sore. The previous table will serve for this purpose. When a sore of either variety is irregular or complicated, it may be attended by so many features of both sores that a diagnosis of its nature becomes absolutely impossible. In such a case it is the part of wisdom to reserve judgment and wait for developments before giving an opinion. No man, who has confidence enough in himself to be willing to take the responsibility of a case of syphilis, should be ashamed to confess ignorance as to the nature of a sore until he has had plenty of time for studying its features and its course. The following table is arranged under each head, for typical as well as for irregular cases.

The typical description in the table is printed in italics, the irregularities in ordinary type.

CHANCROID.	SYPHILITIC CHANCRE.
1. Nature.—*A local tissue disease.*	1. *A general blood disease.*
2. Cause.—*Contamination with chancroidal pus in sexual intercourse;* accidental or designed auto- or hetero-inoculation of chancroidal pus; pre-existing virulent bubo, which, upon opening, becomes a chancroid.	2. *Contamination with syphilitic virus in sexual intercourse;* hetero-inoculation upon a non-syphilitic person, of the secretion of a syphilitic chancre, of syphilitic blood, or of the discharge from a mucous patch or a secondary syphilitic lesion.
3. Situation.—*Upon the genitals or in the groin;* very uncommon elsewhere.	3. *Upon the genitals;* not uncommon upon the lips, nipples, and fingers; very uncommon elsewhere.
4. Number.—*Often multiple both in origin and by spontaneous auto-inoculation.*	4. *Generally single,* sometimes multiple, from the start; not usually spreading by spontaneous auto-inoculation.
5. Second attack in the same individual.—*Entirely possible.*	5. *Almost impossible.*
6. Auto-inoculability.—*Always possible in generations.*	6. *Impossible,* unless the ulcer secretes pus.
7. Transmissibility to animals.—*Possible.*	7. *Quite probable.*

CHANCROID.	SYPHILITIC CHANCRE.
8. Incubation.—*None. Changes commence within twenty-four hours. Ulcer is fully formed on the third day.* Sometimes absorption is delayed, and the ulcer does not appear until after the end of a week.	8. *Never less than ten days; usually about three weeks;* occasionally a little more than two months.
9. Appearance and course.—*Commences as a pustule or an ulcer, and remains an ulcer to the end. Advances rapidly, heals slowly.*	9. *Commences as an excoriation or an induration, and remains as a raw erosion or an indurated ulcer; advances slowly, heals slowly.* Sometimes it remains a dry papule, or is an ulcerated fissure throughout its course.
10. Shape.—*Rounded, oval,* or irregular, if a fissure has been inoculated or several ulcers have run into one.	10. *Round, oval,* or a fissure; not apt to be due to the fusion of several sores.
11. Color.—*Dirty yellowish white or pale pink.*	11. *Livid red, or brilliant blood color, or gray;* sometimes dirty white, sometimes scaly or scabbed.
12. Secretion.—*Creamy, free.*	12. *Scanty, serous, sanguinolent,* sometimes purulent.
13. Edges.—*Perpendicular, often undermined.*	13. *Slanting, adherent.*
14. Floor.—*Uneven, dull.*	14. *Smooth, bright,* sometimes dull.
15. Pain.—*Often present.*	15. *Generally absent.*
16. Induration.—*Absent.* In many cases, however, a hardness, due to inflammation comes on. This sometimes resembles syphilitic induration, but usually is quite distinct from it.	16. *Present,* almost invariably, in the male; more often absent in the female.
17. Phagedæna.—*An occasional complication.*	17. *A very rare complication.*
18. Lymphangitis.—*Not uncommon in its simple inflammatory form, very rare in its virulent form.*	18. *Rather rare, always indolent, exceptions being phenomenal; never virulent.*
19. Bubo.—*Occurs in about thirty-three per centum of all cases, sometimes as simple bubo, which may subside or may suppurate; sometimes as virulent bubo, which necessarily suppurates and becomes a chancroid.*	19. *Invariable* (exceptions two per cent.), *always indolent; occasionally attended by enough inflammation to end in suppuration, but never becoming virulent.*
20. Prognosis.—*Syphilis, as a result of chancroid, is impossible.*	20. *Syphilis, as a result of chancre, is invariable.*
21. Treatment.—*Local treatment all-important.*	21. *Local treatment unimportant.*

THE STAGES OF SYPHILIS.

Syphilis is not a continuous chain of symptoms. It is a broken series of outbreaks, varying in intensity, in duration, and in the length of the intervals between them. During these intervals the patient may seem perfectly well; but, that he is well because he seems well, cannot be asserted. The intervals are called periods of latency of the disease. During these periods, when they occur early in the malady, it is quite evident that the patient is not well. After inoculation the period of incubation is a period of latency, but surely the patient is not then well. Toward the end of the disease, however, the periods of latency become longer; and finally one period arrives very often, which ends only with the patient's death from some other cause than a return of his syphilis, and this period of latency is in most cases one of health; the patient is well.

That the poison continues active during the periods of latency (the early ones) is evident from the fact that vaccinal syphilis has often been

acquired from the blood of a vaccinifer not at the time bearing any trace of syphilis upon its person; that syphilitic women, during periods of most absolute latency, have brought forth syphilitic children; that traumatisms upon syphilitics, in a period of latency, often call out syphilitic lesions (cauterisatio provocatoria, p. 78).

Therefore it becomes impossible to state absolutely that the disease syphilis is naturally divided up at all. It may be one continuous malady with remissions, but really continuing all the time. Yet facility of description, custom, and the peculiar character of the outbreaks of syphilis, have justified its division into stages, and these stages are commonly known as primary, secondary, and tertiary syphilis. The attempt to make a separate, intermediary syphilis, between the second and third stages, has not met with general favor, and the effort to christen the final phenomena as quaternary has also miscarried. There remain, therefore, the three stages of common adoption: the primary, the secondary, the tertiary.

Primary syphilis is all that portion of the disease lying between the moment of infection and the time of appearance of the first general eruption with its fever and general ganglionic engorgement; it therefore includes the initial lesion with its accompanying lymphangitis and adenitis, but nothing more.

Secondary syphilis.—As soon as the secondary incubation has passed, secondary syphilis begins. It may date as early as three weeks from the time of appearance of the chancre; it generally does not commence for six weeks or two months, and may be delayed much longer, especially if mercury has been used in treating the primary stage. Most of the symptoms of this stage are superficial. They are first congestive, leaving no scar, and occurring on the mucous as well as on the cutaneous expansions. Gradually, as time passes, the lesions become deeper-seated, and finally the second merges so gradually into the tertiary stage that it is impossible to fix upon a positive boundary between them.

It is just at this point that the French dermatologists have attempted to group together an intermediary set of lesions liable to occur upon the integument, and to call them intermediary syphilis; but it is more customary in this country, and equally accurate, to speak of these symptoms as late secondary symptoms, and the term is just as convenient—perhaps more descriptive.

The duration of secondary syphilis, like the duration of the whole disease, varies so greatly that it is not only impossible, but even unwise, to attempt to confine it within definite boundaries. In a general way, in most cases the symptoms merge into the tertiary forms during the second year; but secondary lesions continue in many cases to crop out occasionally in the third year or later, intermingled with the deeper lesions of tertiary disease. It is not at all uncommon for a patient with a gummatous, destructive ulcer of the throat to have also upon his palm a superficial scaly patch very similar to what he may have had during the first year of his disease.

And, on the other hand, but more rarely, the symptoms legitimately belonging to tertiary syphilis occasionally come on earlier, and appear among the secondary symptoms. Gummata in various situations may thus appear prematurely; nodes on bones, advanced symptoms of nervous disease, hemiplegia, epilepsy, sometimes show themselves at the end of six months, and are followed by secondary symptoms, instead of remaining in their regular place and appearing during the second year, or later.

These irregular forms of syphilis have scandalized some observers, and made them wish to give up secondary and tertiary distinctions of symptoms, since the facts do not bear out the theories. But it is not well to throw away a good thing simply because it will not serve every purpose. The stages of syphilis are certainly very convenient, and afford the student assistance in his observation of the disease, and in its treatment. Therefore they should be preserved. The exceptions in syphilis are its chief beauty; there is no monotony about it; and if descriptions of the disease did not in their first plain statements practically ignore exceptions, there could be no descriptions at all, for there probably is not a single feature of syphilis, from the chancre to the most ultimate symptom due to a visceral lesion, which may not be lacking in a well-marked case of syphilis.

Tertiary syphilis commences on the boundary line of secondary syphilis, somewhere in the second year usually, and embraces everything which may happen afterward due to the disease. The lesions are infiltrative, gummatous, often destructive, ulcerating, and include most of the connective-tissue parenchymatous changes and gummy deposits which involve the viscera.

In inherited syphilis the symptoms of both secondary and tertiary stages are customarily more or less combined. The child, when born, often has parenchymatous changes in its lungs, liver, kidneys, thymus, and spleen, with changes in the epiphyses of the long bones, and at the same time superficial, scaly, erythematous, papular, and excoriative patches upon its integument and mucous membranes.

In acquired syphilis the whole of the tertiary stage may be absent. The disease not uncommonly, under judicious treatment, ceases entirely at the end of the secondary stage, and the patient lives for years without another symptom, raising healthy children, and himself to all appearances well. More rarely the secondary stage may be skipped entirely—this also usually under treatment—and the disease may only show itself after a longer or shorter period of latency in the tertiary gummatous stage. I have seen a number of instances of this sort occurring after almost every variety of treatment, and after no treatment at all.

Malignant syphilis.—This is a final variety, in which the disease runs riot, respecting no stages, obeying no rules. Gummata may spring into existence within a few months after chancre, and the most desperate late lesions follow each other without any period of latency, and respond very imperfectly to ordinary treatment. This style of disease sometimes kills; but it bears this measure of comfort with it: that, if the patient survive, he is apt, though mutilated with scars, to be rid of his syphilis forever. The malady seems sometimes, in this way, to exhaust itself in its fury, and to expend during a number of months that energy which it sometimes stores up to carry itself over long periods of years.

THE PERIOD OF SECOND INCUBATION.

The second incubation commences when the chancre appears, and ends when general symptoms come on. This period often is not one of latency, strictly speaking, since active symptoms of syphilis are usually present upon the patient during the whole of it, for the chancre has rarely healed before the first eruption comes out (unless treatment keeps *it back);* and even if the chancre has gone, the inguinal glands are cer-

tain to remain engorged during a much longer time than the period of secondary incubation.

The length of the second incubation in untreated cases varies from twelve days, which is the shortest that has been observed, to between four and five months; but commonly, in untreated cases, it lasts about six weeks. At the end of this time it is believed that the organism has become so saturated with the poison, which has been multiplying within it, that an explosion necessarily takes place in the way of general symptoms, in order to enable the blood to get rid of some of the unnatural material it contains.

During the second incubation the general health may appear flourishing, but generally the patient commences to get pale and languid, or more or less depressed. His red cells diminish in quantity in the blood, and the number of white cells increases. The appetite is apt to falter and the digestion to become less vigorous, yet there is often no positive failure of health until the eruptions appear, and sometimes no obvious failure even then. The patient may be about his affairs as usual, carrying a chancre, which does not disturb him greatly, feeling in good health, and yet covered with a roseola, which his physician discovers for him, of which he himself has been totally unconscious, and which has not been ushered in by any fever, or by any subjective symptom of which the patient has taken note.

SYPHILITIC FEVER.

All descriptions of syphilis, from the earliest times, have referred to fever as being one of the accompaniments of the disease; but no thorough knowledge of it was obtained by the profession until the laborious investigations of Güntz, with the aid of the thermometer, had established its finer details. In 1873,[1] Güntz's results, many of which had appeared in different articles in medical journals during the previous ten years, were put into book form, and this volume is still the highest authority upon syphilitic fever.

The fever of syphilis has been compared to that of the exanthemata. It comes upon the patient unawares during the period of second incubation, and precedes the outbreak of the first eruption. It is this fever to which the name syphilitic is given. Other febrile states due to syphilitic lesions are not, as a rule, called by this name. With a true chancre sometimes a bubo suppurates, and the formation may be attended by a rise of temperature; but this would not be syphilitic fever. Again, in all the cachectic conditions of tertiary syphilis, with the bone and visceral lesions in brain syphilis, etc., a rise in temperature is one of the clinical features of the affection; yet this is not syphilitic fever.

The true syphilitic fever, according to Güntz, generally comes on at about two months after infection—sometimes as late as three months. This would place its date of appearance, in average cases, during the early part of the second month after the appearance of the chancre, and clinically this is the date at which it is well to be on the watch for fever, so as to be warned of the first eruption, which is about to appear. The type of the fever may be continued, remittent, or intermittent. It may consist of a single short outburst, or may last for days. Occasionally, it closely resembles tertian ague; and sometimes, when intense and accompanying

[1] J. E. Güntz: Das syphilitische Fieber. Leipzig, 1873.

syphilitic pains in the muscles and joints, it is indistinguishable from a mild attack of inflammatory rheumatism. More rarely still, it is accompanied by great prostration, attended by headache and epistaxis, and assumes a type suggestive of typhoid fever.

Its occurrence is by no means uniform. Güntz believes it to be found in only twenty per cent. of all cases. Lancereaux puts it at sixty-six per cent. Fournier believes it more common in women. We may, therefore, conclude that in not more than half the cases is it to be expected at all. Clinically, it is certainly very rarely of any importance. If it is looked for by aid of the thermometer, it will be often found; otherwise it will rarely be thought of either by the patient or physician, excepting in a minority of cases where the prostration is great, or the range of temperature high.

The thermometer rarely marks higher than 102° Fahrenheit in syphilitic fever; 104° has been pretty generally considered to be a point above which it does not go. I am only aware of one case, reported by Bremer, in which this limit was exceeded.

The symptoms attending the fever are very variable. Anæmia may be quite marked, the pallor being due to the well-known diminution in the hæmoglobulin of the blood, first pointed out (1844) by Grassi. General depression and a feeling of being sick is a common complaint. Pains in the bones, in the joints, under the sternum, in the side and back, in the head, all of them worse at night, are apt to be complained of. The night headache is pretty constant and sometimes frightfully severe, the pain coming on at a stated hour, and yielding at a stated hour, often with great regularity. The joint pains may also get worse at night. They generally do so, but not to the same extent as the head pains. Sometimes the joints and the bursæ under the insertions of the tendons (particularly at the elbow and knee) become the seat of effusion, and are very sensitive to handling. The patient's skin is bathed more or less profusely in perspiration, the urine is acid and full of urates. In such a case, acute articular rheumatism is closely simulated. I have observed one very well-marked case of this character in the Charity Hospital, which yielded a prompt response to mercury.

Where the fever runs high and an eruption is coming out, the mistake of confounding syphilis with measles, or even with small-pox, has been made.

There may be enough shortness of breath and quickness of pulse to suggest lung disease. The stomach symptoms may be the most prominent. An unwonted excess in the appetite may be a feature of early syphilis (boulimia). Fournier found it to be not very uncommon in women. Nausea and inappetence are more common, with occasionally light diarrhœa.

Jaundice may come on with syphilitic fever, due to catarrh of the bile-ducts, from engorgement of the mucous membrane, or pressure upon the ducts by enlarged glands (Lancereaux).

Pressure upon the lower third of the sternum will sometimes evoke a pain not otherwise complained of, and the anæmia may be great enough to give the soft, blowing character to the first sound of the heart.

Syphilitic fever usually disappears soon after the general eruption comes out. Its own special features are so varied that its diagnosis depends upon the previous (or actual) existence of a chancre and the presence of evidences of general syphilis, such as the falling of the hair, an eruption, epitrochlear and post-cervical ganglionic engorgement. Its

treatment is that of general syphilis in the early months. Syphilitic headache, the most serious symptom of this fever, may sometimes be controlled by minute doses of mercury repeated at short intervals, as suggested by Trousseau. One-twelfth of a grain of calomel every one or two hours, for twenty-four hours, will sometimes overcome it. It is not well to continue these minute, but often repeated doses for any length of time, since mercury given in this way is apt to excite speedy salivation in certain people.

SYMPTOMS ATTENDING THE BEGINNING OF GENERAL SYPHILIS.

During syphilitic fever, or at the beginning of general syphilis, when there is no fever, it is common to observe certain symptoms. These need not be fully described here, since repetition is to be avoided. They may be found under their appropriate heads; but, before going into syphilis as affecting the tissues and organs, it is well to mention these symptoms, if only by name.

With the scabs in the hair of early syphilis, and the mottling of the skin, the ganglionic pleiad in the groin still remaining, and perhaps the chancre being still raw, we generally find that one or both epitrochlear glands are indolently indurated, resembling the glands in the groin, and that certain glands in the posterior chain of the posterior cervical glands are similarly affected. The glands most characteristic among these are those lying on the occipital bone on either side of the nucha. These glands, as well as the glands in the groin, generally disappear, with or without treatment, as the disease advances, and it is not well to depend upon them to corroborate syphilis after the first few months.

Another symptom is a generalized falling of the hair (syphilitic alopecia). The hair thins out over the whole scalp, does not fall in patches, and with this there may generally be noted a tendency to a fall of hair from the beard and eyebrows, and more or less from the whole body in severe cases. This alopecia, however, is often confined to the scalp. When the hair falls late in syphilis, if the falling out of hair is general, it is due to cachexia; if it is local, it is due to a local physical lesion (ulcer) involving the papillæ, and the hair does not generally return when the disease gets well, as it does after the alopecia of early syphilis.

The throat symptoms—erythema, mucous patches—will be described later. They are very characteristic, and should always be looked for in the outbreak of general syphilis.

Certain analgesias of early syphilis have been much spoken of since Fournier's description of them as they occur in women early in syphilis. Inability to distinguish heat from cold, anæsthesia of certain limited areas of skin, analgesias due to early syphilis, have been described mostly as found in women. These symptoms do not seem to stay long; they are rarely observed in ordinary practice, and do not call for any modification in the general treatment. The backs of the hands and wrists seem to suffer more often than other parts. Fournier has described this malady in his admirable treatise on syphilis, studied especially in its relation to women, Paris, 1873.

CHAPTER VI.

THE GENERAL TREATMENT OF SYPHILIS.

Syphilis a self limiting Malady.—It gets well under all Treatments sometimes, but yields the best Results to small Doses of Mercury continued for a long Time.—Syphilization and Tartarization.—The Hot Springs of Arkansas.—Preventive Treatment of Syphilis.—Excision of Syphilitic Chancre.—The Hygienic Treatment of Syphilis.—The Hygiene of the Mouth.—Hygiene of the Anus and of the Genitals.—Hygienic Medication.—Kumyss.—Specific Treatment of Syphilis.—General Consideration of the Value of Mercury and the Different Kinds of Mercurial Treatment.—Salivation.—Time at which the General Treatment of Syphilis should be commenced.—Detail of the Tonic Treatment of Syphilis by Mercury.—The Time at which a Tonic Course of the Mercurial Specific may be stopped.

SYPHILIS is naturally a self-limiting malady, and its general treatment may be, and often is, left entirely to nature. Many a woman, and occasionally a man, gets syphilis without knowing it, and runs through the disease into health without any specific treatment at all. Indeed, it may perhaps be justly doubted whether treatment of any kind can shorten the duration of syphilis at all, for the disease will, and it does, crop out at remote dates after any and all kinds of treatment (more often after certain kinds of treatment than after others, I believe), and there is no positive and certain test which can be applied to a person to determine whether he is, after treatment, free from the disease or not. The cauterisatio provocatoria of Tarnowsky (p. 78), has been but a short time before the profession, but its pretensions have already been assailed by Auspitz and Kaposi.

There is no doubt whatsoever that certain drugs restrain the manifestations of syphilis and cure the symptoms. Among these the different preparations of mercury and of iodine undoubtedly hold the first rank; but the opponents of the internal use of mercury claim that, by curing the earlier symptoms, the disease proper is only being suppressed, that its total duration is thereby prolonged, and its later symptoms rendered more obstinate and more destructive. This assumption, however, is the result of the heat of controversy more than of any calm recognition of facts.

Who shall say, in a given case, how long syphilis is to last? There is no certain and reliable standard by which the disease may be judged or the quality of its virulence predicated. This matter has already been discussed in the section on prognosis (p. 79), and need not be reviewed here; but certain it is that there is an unknown element in syphilis which alone can explain the endless irregularity of its forms and the picturesque variety of its symptoms.

One fact about syphilis is well known: it has symptoms, and certain drugs will keep down those symptoms; and it is as wise and as just to say that the quinine which breaks tertian ague only prolongs the disease by suppressing the symptoms (and some do assert this), as it is to hold that mercury prolongs syphilis by keeping symptoms in check.

Moreover, the use of mercury has been shamefully abused in times past. Crusades have been preached against the drug by valiant champions of other and seemingly more simple and more natural methods, yet always, century after century, the profession clings to mercury; and to-day it heads the list of specifics, as being the most efficient for good of all known drugs, in the writings of a great majority of the recognized authorities upon syphilis. The only question is how to use mercury so that it shall inflict the greatest possible harm upon the disease without injuring the patient. A solution to this problem is what is required. I have done what I could toward solving it—with what effect, time must show.

It is not within the province of this volume to enter into a study of the history of the treatment of syphilis. Probably all known drugs have been at one time or other tried against it; but they have disappeared one after another. It is generally a new vegetable product which claims the power of eradicating syphilis. Sarsaparilla is still held in high esteem in some quarters, and guaiac in others. Cundurango bark came lately upon the scene, but promptly disappeared. I believe that tuyuja is the present novelty—destined, doubtless, to share the fate of its predecessors. Nearly all the natural mineral springs, especially the sulphur springs, possess, it is claimed, the power of eradicating syphilis, or rather that mysterious entity known as "the effects of syphilis and of mercury," from the system; and for some springs actual specific powers over the disease are assumed, such as the Hot Springs of Arkansas, the Paso Robles Springs of Colorado, the springs of San Diego in Cuba, and others.

Finally, all sorts of cures abound: water cures, dry cures, sweating cures; cures by the grace of God (Diday)—that is, where nothing is done in mild cases beyond what is suggested by ordinary hygiene, the disease being left to run itself out by nature; cures by syphilization and by tartarization; and finally, by drugs, cathartics, diuretics, sudorifics, tonics, mercury, iodine, etc.

When so many methods are strongly advocated, it seems fair to suppose that the disease in question is incurable; but, on the contrary, patients get well, or seemingly well, under all these methods and under all systems of treatment. The reason of this seems to me to be that the disease is self-limiting and symptoms cease to appear, in a majority of cases, in the long run, with treatment, without treatment, sometimes despite treatment.

The aim of a rational treatment, therefore, must be: to suppress symptoms and prevent them from doing harm during their existence; to control symptoms and prevent relapse without harming the patient in any way; and so to manage the disease that it may not be contagious during its existence (by keeping down such symptoms as yield contagious secretions), that the patient may be made able to marry as soon as possible and to produce healthy offspring, and that the symptoms of the disease during their progress shall be restrained from leaving unsightly scars or damaging the structure of tissues or organs during their existence.

These ends may be more certainly attained by the judicious use of the preparations of mercury and iodine than by any other means; and this is the reason why these drugs hold their place in medicine as anti-syphilitic specifics, notwithstanding the fact that the disease goes on and runs its full course in spite of their use, and notwithstanding the fact that much harm has doubtless been done with the drugs by their unskilful use, and that mercury has many powerful enemies who constantly cry out against it.

Of late, two German authorities, whose high position renders their verdict worthy of respect—Sigmund and Zeissl—have declared themselves rather in favor of Diday's way of regarding syphilis.

Sigmund[1] thinks that many cases of syphilis do better without than with general treatment. He even goes so far as to say that general treatment sometimes does harm. He thinks that forty per centum of untreated cases have such light eruptive outbreaks that the patients do not detect their secondary symptoms at all, while ten per cent. of the cases having obvious symptoms get well promptly by the use of local measures alone. Sigmund thinks, therefore, that treatment should not be commenced until secondary symptoms appear—and not then, unless the symptoms threaten to become serious.

The only deduction to be drawn from the above conclusions of Sigmund is, that he is fortunate in treating an exceptionally high average of very mild cases of syphilis. The fact that so conservative an authority still uses mercury for severe cases proves that he does not consider this drug harmful when judiciously employed, and shows that he, with most other modern authorities, are giving up the careless and lavish routine use of mercury. They are using less mercury, but are still using it as a specific.

Zeissl,[2] in a more studied essay, giving his present views about the treatment of syphilis, states that by observing the evolution of syphilis, under the expectant treatment, he learned that the malady was atypical, seeming to depend, for the length of time it lasted and the severity of its symptoms, more upon the personal physical individuality of the patient than upon the treatment to which he was subjected.

Therefore Zeissl adopts the expectant treatment for a time. He allows the disease time to bloom—to ripen, as it were. If the early eruptions go down with reasonable promptness, he uses no mercury. If they hesitate to disappear, he tries the iodides, and only in severe and obstinate cases does he have recourse to mercurials at all.

In this way he thinks that the total duration of the disease is lessened, and ultimate serious relapse rendered less probable. He believes that the disease blows itself out, as it were, if allowed free play in its earlier stages. In all severe cases, however, and in all obstinate ones, he still depends upon the faithful services of friendly mercury.

In short, he too is giving less of the drug. From all sides testimony is coming in, in one way or another, favoring a reduction in the amount of mercury used in the treatment of syphilis.

Some of the symptoms of syphilis disappear under the influence of intercurrent disorders. Thus, Mauriac has shown,[3] in studying the cutaneous symptoms of syphilis, that erysipelas occurring upon the surface of a person with a syphilide acts generally as well as locally, portions of the syphilitic eruption distant from the area occupied by the erysipelas getting well just as those spots do over which the erysipelas passes; but with this difference, that the more distant the situation of the spots from the erysipelatous patch the less promptly do they get well.

This is not more strange than the disappearance of cutaneous lesions, not syphilitic, on the advent of some internal malady—tubercular meningitis, typhoid fever, and others.

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[1] Wiener med. Wochenschrift, No. 10, 1879.
[2] Wiener med. Zeitung, Nos. 1, 2, 3, and 4, 1879.
[3] Etude clinique sur l'influence curative de l'érysipèle dans la syphilis. Paris, 1873.

Syphilization and tartarization, as remedies, belong apparently to this class. By these methods of treatment the skin is constantly and repeatedly irritated up to the point of suppuration in numerous spots, until finally no more suppuration can be produced by the irritants supplied—chancroidal pus, or that of irritated chancres, etc. Under this treatment, eruptions very naturally disappear, and thus a cure of syphilis may be claimed. But syphilization can never be generally popular. It produces far more numerous and unsightly scars than the disease itself, and, rather than use it, most people would prefer to let the malady run its course until the third stage, and then use the iodide of potassium for the treatment of gummata and threatened disease of internal organs, just as the syphilizers themselves do.

THE HOT SPRINGS OF ARKANSAS.

These springs have of late become very popular, especially among the people, and some estimate of their value must be given. I have not had an opportunity to visit the springs personally, but I have had charge of numbers of patients in all stages of syphilis, who have been to the springs either before or during the term of my treatment, and have remained there for periods varying from a few days up to several months. I feel, therefore, reasonably familiar with the methods employed (as a rule) at the springs, and capable of judging the results, on account of having watched many patients since their return.

I have been unable to ascertain that there is any quality in the water to which the result claimed to be attained may be ascribed, excepting the heat. The water is certainly quite poor in mineral ingredients, while its alleged magnetic qualities are imponderable.

When a patient goes to the hot springs in any stage of syphilis, he is apt to be mercurialized to excess by the inunction of mercurial ointment. There are excellent medical men at the springs, who use mercury judiciously; but, unfortunately, the fame of the place attracts some physicians who make use of the supposed virtues of the waters to shield their own incompetence, and the credulous patient suffers. In directing patients to the springs, in the cachectic stage of the disease—for example, where change is of great value to the patient he should be regularly consigned to a reputable physician, or his trip is apt to do him but little, if any good—possibly, to result in harm.

I believe, however, that all the physicians at the springs, even the very best, use mercury by inunction or otherwise, in connection with the baths, thus plainly avowing a disbelief in those specific and curative powers of the waters over syphilis which are generally ascribed to them by popular superstition. Iodide of potassium internally is also used in large amounts by the physicians at the springs.

I have found that patients who go to the hot springs with chancre, or during the earlier periods of syphilis, do not prosper any more rapidly than if they had remained at home, and the longed-for exemption from relapse after a six weeks' course at the springs, with any amount of inunctions, is far from being justified by the result. Relapse follows just as certainly as after the same amount of mercury used at home in the same way, and no more, and no less certainly, according to my experience.

Late along in the disease, however—especially if the patient be broken and cachectic; if his appetite and his vitality require the influence of

change; when he fails, perhaps, to respond at all to the iodides, and mercurials, even in small doses, depress him—then is the time to send the patient to the hot springs. The change alone is likely to benefit him, and the waters certainly do seem to possess a tonic power over these cases, which brings them up sometimes far more promptly than seems possible at home, and helps to cure them not only of their active symptoms, but sometimes to restore them to good general health.

Patients sent to the hot springs in the later stages of cachectic syphilis, generally return improved and gratified with their experience. Those who go early are usually disappointed, and their disease not sensibly modified in any way.

If the springs are to retain any permanent value, it is well that the public should be dispossessed of the absurd idea with which it is now so thoroughly imbued, that the waters themselves possess specific qualities, and have the power to drive out syphilis completely, and prevent relapse. The springs certainly have their value, but it is not this.

PREVENTIVE TREATMENT OF SYPHILIS.

It is hardly appropriate in this volume to touch upon the subject of prostitution. Prostitution has probably existed from the beginning of time, and it doubtless will continue to exist until the end of time. The puritanical spirit which causes men to ignore this fact is to blame for a certain amount of the syphilis now present in the world. The only way apparently to put any check upon the spread of syphilis by prostitution, is to legalize the latter occupation, and to subject it to close and constant scrutiny by officers responsible to the State. The general spread of intelligence through the world will doubtless bring this about sooner or later; but, until then, the young men of the community, and through them their wives and their children, stand in constant danger of the disease. Reasoning from my own experience in a large city, syphilis is greatly on the increase among the higher classes of the community. Very many young men in the best walks of life get poisoned by their own folly, and carry the germ of disease into their homes. Perhaps, as is said now to be the case in Portugal, we shall some day, as a community, become so saturated with syphilis, that the type of the disease will become very mild, and we shall not consider it of much importance; but it is rather revolting to one's feelings to take this view of the case.

Leaving prostitution out of the question, and coming more directly to the prophylactic treatment of syphilis, it may be asked, having been exposed to the poison of syphilis, may the disease be prevented? This question has, as yet, no answer based upon well-observed facts. Certainly, if the syphilitic poison—the secretion of chancre, for example—comes only into contact with the unbroken integument, it may be washed away, and the individual remains sound. The same is equally true for the mucous membranes. Cases of mediate contagion (p. 75) prove this as well as those cases in which two healthy men have had intercourse on the same evening with the same syphilitic woman, when one of the men escapes infection, while the other, in due time, has chancre. Such instances have been observed more than once. I have such a case among my own patients. The explanation is simple. The poison deposited beneath the prepuce in one case finds the semi-mucous membrane sound, and does not effect an immediate communication with the absorbents.

It remains inert, and is washed or rubbed away by the patient. In the other case an abrasion or little fissure exists in the surface epithelium, the poison is promptly absorbed, and no amount of washing can then save the patient from chancre, which will come on after the proper period of incubation has passed. Whether the poison of chancre deposited upon the unbroken epithelium, either of the skin or of the mucous membrane, can in time, if retained in place, work its way through the epithelium by a corroding process, and gain access to the absorbents, is not known.

Now comes the question—when once a chancre appears, may syphilis be averted? It is not proven that it can be, although the evidence of some investigators goes a certain distance to show that it may be. The whole question is at present involved in doubt, and is now the subject of active inquiry and experiment in the medical world. Much difficulty attends a just solution of the problem, particularly at this day, when so much confusion exists about the quality of the poisons of chancre and chancroid, their identity or otherwise; and because investigators still trust to that single fallacious symptom—induration—and base their prognosis of syphilis upon this alone, seeming to disregard the value of confrontation, and apparently forgetting to consider the varied forms of pseudo-chancre, some of which show syphilitic induration in its most typical form. Such a pseudo-chancre, of course, whether cut out or left alone, will not be followed by any signs of early syphilis.

The question of the value of the excision of chancres need not be reopened here; it has already been discussed at p. 93. It is simply certain that, at the present date, no positive assurance can be given to a patient that, if his chancre be cut out, he will escape general symptoms. When the chancre is suitably situated—as, for instance, upon the edge of the preputial orifice, or elsewhere—in such position that it may be easily and thoroughly extirpated, there is no harm that can follow cutting it away; but it should be removed with a distinct understanding that an intelligent experiment is being performed, and nothing more, and that the chances are against success, if the chancre be a true initial lesion of syphilis.

THE HYGIENIC TREATMENT OF SYPHILIS.

The hygienic surroundings of a patient influence his general health, and upon the maintenance of good general health often depends the quality of the syphilitic symptoms in a given case. This remark is not absolutely true—indeed, probably, no remark made about syphilis is absolutely true. Some old men, with broken vitality, in the decline of life, get syphilis, and have it in the very mildest form, while robust youths sometimes sink away promptly under a malignant onset of the disease. The activity of the poison in babyhood is well known, and that, too, not in cases of inherited syphilis alone. Epidemics of vaccinal syphilis clearly prove the virulence of acquired syphilis in the infant. Then there are apparently certain diathetic or constitutional peculiarities of the individual, which influence the quality of his syphilitic symptoms, and act independently of hygienic surroundings and of everything else. This subject has been discussed in the section on prognosis, p. 79.

Therefore it cannot be absolutely said that hygiene, when good, will make syphilis mild, and when bad, will make it severe, for this is not the

case. It is possible, however, I think, to make the following assertion with truth: that, other things being equal, the better the hygiene and dietetics, the more creditably will the patient weather the storm, and the more certainly will his disease get well without materially damaging him. This assertion, of course, implies that, in addition to his hygiene and dietetics, the patient shall make use of intelligent therapeutics.

The hygiene of syphilis is that of common every-day life. We no longer confine patients to their beds for the treatment of syphilis, or even to the house. The old notion, that it is such a serious matter for a patient taking mercury to catch cold, cannot be held in force. Surely it is wiser for a patient taking mercury not to catch cold, because the cold is apt to upset his stomach and to interfere with his treatment; but beyond this I do not know any disadvantage likely to arise from taking cold. And I do not believe that a patient taking mercury in a mild, continuous way, is any more apt to catch cold upon exposure, than another under the same circumstances, not taking mercury. Mercury may open the pores, as the popular notion is, for all that is known to the contrary. Mercury certainly is excreted in minute amounts by the skin, in the perspiration; but it means nothing to say that the pores are open—they undoubtedly always are open. Finally, to sum up, I believe that a patient, while taking a mild, continuous course of mercury, may go out in the cold, the rain, and the storm, exactly in the same way as if he were not taking the drug. Precautions against taking cold are certainly desirable in syphilis, as they are in any other general depressing malady.

Moreover, a cold taken in the active stage of syphilis may produce sore throat, and this sore throat, due primarily to cold, may be the occasion of a local outcrop of mucous patches, and syphilitic ulcers in the throat, which may continue long and greatly annoy the patient, as well as possibly aggravate his disease by interfering with swallowing, and therefore, with nutrition. An accidental sore throat may produce syphilitic symptoms in the throat, just as smoking may, and just as a blister placed upon the skin, or a sulphur-bath, may call out a syphilitic eruption upon a patient whose skin until then has remained clear.

Therefore it is very desirable that a patient in the active stages of syphilis should take all precautions not to take cold; but he should be made to understand, that his cold, if he gets it, is his own fault, and not to be blamed upon the mercury he is taking. Probably the best precautions against taking cold are the use of hair-mittens every morning upon the dry skin of the whole body, when there is no general eruption; soaking the feet upon retiring at night, in cold water, washing the neck and chest in cold water in the morning, and not wrapping up the throat tightly while out of doors,—as well as the avoidance of wet feet and drafts.

Cleanliness of the whole surface of the body by frequent bathing is very desirable during the whole continuance of the treatment of syphilis—warm water (not too hot), toilet soap, and a soft towel, being used. Of exercise and air the patient should have an abundance. The function of the stomach and the intestine should be ministered to by appropriate food, and regularity as strict as possible should be observed in regard to meal-times and the hours of sleep.

In regard to the kind of food to be used, no special restrictions need be put upon the patient. He may eat what he chooses, and what he knows will agree with him, in full quantity, as if in ordinary health—*a plain, mixed* diet of meat, vegetables, bread, butter, and milk being

most appropriate. There is no objection to the use of wine or beer, in moderation, with the meals; but any excess in alcohol in any shape is objectionable, and drinking between meals should not be allowed.

Under certain circumstances the regulation of food becomes very important, namely, when the medicines which must be given to control important symptoms irritate the stomach so that they cannot be borne. The mercurials in any form, in some cases of weak digestion and irritable bowels, cause more or less griping and colicky pain, and the iodides often produce nausea and disability of the stomach. The mercury may be made to remain quietly in the intestine by the aid of opium, but it is far better to accomplish the same result, if possible, by means of a change of food.

When, therefore, moderate medication, such as may be necessary to keep down the symptoms, is found to produce pain and diarrhœa, all fruit and green vegetables must be denied the patient. He should take no beer, and but little fluid of any sort. He should eat stale bread and butter, tender meat, rice and boiled milk, eggs and toast, and by the exercise of these simple precautions he will often be able to continue his mercury and avoid opium. If another medicine must be given, it is well to commence with gr. x. doses of the subnitrate of bismuth; and if this serves to comfort the intestine, and keep pain and diarrhœa in check, it certainly is simpler and less apt to do harm than opium. Besides these means, it may sometimes be necessary to employ opium as well; but, if the opium can be escaped, it is to the patient's advantage.

The same general precautions in regard to diet may be employed when the iodides disagree. The subcarbonate of bismuth may be tried instead of the subnitrate in these cases.

The residence of the patient is not a matter of much importance, if his general health and his appetite remain fair, and his symptoms yield reasonable obedience to the medicines employed. Change of air, however, is always desirable occasionally, even to persons in ordinary good health, and this is the more necessary when the patient is laboring under a devitalizing disease. Therefore, even if the course of the malady leaves nothing to be wished for, it is wise, for such patients as can afford the time and the money, to make a change of residence for a certain period of time each year, in the summer if they live in town, in the winter, if their home is rural.

This change of air and surroundings becomes a matter of necessity in some cases, particularly in the later periods of the disease, if there be any tendency to cachexia. Under these circumstances medicines sometimes fail entirely to improve the general or the local symptoms, while a change of air, even with a cessation of medication, will yield excellent results. I have known patients, both early and late in the disease, who fail to respond to medication until that medication has been supplemented by a change of air, when not only would the symptoms promptly mend, but the tone of the stomach would improve, and medicines which could not be taken at all without interfering with digestion could be borne without a murmur. This is particularly the case with the iodides.

In one case under my care this effect was strongly marked. The patient had a node which threatened to destroy the nasal bones. He could not take the iodides without having his stomach totally upset, while at the same time the iodides produced a brilliant crop of purpura on each occasion when they were tried. I therefore sent the patient to the country, with directions to continue his medicines there. A few days

sufficed. He bore the drug well, his purpura disappeared, his stomach regained its tone, the node in his nose visibly diminished in size. He therefore returned to the city, thinking himself safe; but a few days convinced him to the contrary: his stomach again refused food, his purpura returned, and he was obliged to go back to the country, and to remain there until his node disappeared, which it promptly did.

The advantage patients in the cachectic stage of syphilis often derive from visits to springs, or to cities even, for the purpose of consulting some special physician about their disease, is no doubt sometimes due to the improved hygienic effect of their surroundings. This effect in New York City seems to last about six weeks, after which patients become used to the locality and fail any longer to improve in it—from the effect of climate alone. How long this improving effect of change lasts in other localities, I do not know.

The hygiene of the mouth is of the first importance in the treatment of syphilis. It is desirable to give mercury and to avoid salivation, and the condition of the mouth and of the teeth is therefore of the first importance. Mouth lesions and throat lesions form some of the most obstinate features of the disease, and these lesions are less apt to be severe when the mouth is kept clean and free from the contact of irritants.

At the very beginning of syphilis, therefore, before the mercurial course is commenced, the patient should be sent to a dentist to have his teeth put in thorough order. All the tartar should be carefully scraped away from the necks of the teeth, and all old stumps extracted, and sharp projecting angles of teeth likely to come into contact with the tongue filed off. The patient should be instructed that he will do well to visit the dentist regularly every six months if the tartar tends to reaccumulate quickly, as it does in some cases. During the whole of the treatment a very soft tooth-brush should be used, for the stiff bristles of a hard brush cut and injure the gums, and make them more apt to become irritated under the influence of mercury than if a soft brush be used. Any tooth-wash employed, or tooth-powder, should be strongly alkaline and a little astringent. A good, simple tooth-wash is made by putting half a teaspoonful or more of bicarbonate of soda into a glass of water, and adding a teaspoonful of tincture of myrrh. Ordinary white castile soap makes a good and simple tooth-paste, and the mouth may be washed out afterward with some alum and water, or some tincture of krameria (ʒ j.) in aquæ gaultheria (℥ iv.).

By keeping the teeth in order and the mouth clean by these and similar precautions, mucous patches become less annoying and easier to manage, and the effect of the amount of mercury given can be more closely watched, since one is not apt to be misinformed as to the cause, should the edges of the gums begin to grow soft and tender.

Smoking should be absolutely forbidden during the first year at least of syphilis, and often for a much longer period. If the patient will persist in smoking, he ought to be made to do so at his own risk, and should be willing to pay up for the pleasure of his smoking by the pain of more or less sore tongue and throat, and a great number more of mucous patches and mouth lesions than he would otherwise have had. Chewing tobacco is in many cases even worse than smoking. It is well also for the patient to avoid much highly spiced or stimulating food, since such things also help to keep the mouth tender.

A pipe is a dangerous thing for a patient with syphilis to use, for he *runs the* risk of infecting any friend who might use it, the secretions of

mucous patches and syphilitic ulcers in the mouth being particularly contagious.

The hygiene of the genitals and of the anus is also very important in syphilitic cases. These parts in both sexes should be kept scrupulously clean and dry, otherwise mucous patches and condylomata, excoriations and ulcerations, are to be looked for. Should there be any tendency to moisture about these parts externally, they may be dusted with dry powders, lycopodium, starch, bismuth, with or without a little calomel. Moisture beneath the prepuce may be kept in check by the insertion of a thin layer of absorbent cotton or of prepared lint beneath it, twice a day, after it has been washed. It is well, in all cases, if possible, to have the patient wash the anus with soap and water after each action of the bowels. The umbilicus, also, in fat people, and the skin under the breasts, in fat women, require frequent washing, drying, and dusting, to preserve the parts in good condition during the eruptive period.

HYGIENIC MEDICATION.

All such medicines as are used in syphilitic cases, for the purpose of maintaining the general health or regulating the functions, come more justly under the head of hygiene than of specific medication.

All tonics find a fair field for their exercise in syphilitic subjects, and do good—not, perhaps, in curing the disease, but by holding the patient up while the disease works out its periods. The effect of mercury, when given in small doses for a long or for a short time, is undoubtedly tonic, as I have shown;[1] but it is not at all on account of this tonic action that mercury given in minute doses eliminates the syphilitic poison. Other drugs are far more tonic in their action, but, having no specific power over the symptoms of syphilis, they directly modify the disease but little, if at all. The only advantage I have ever claimed for the long-continued use of mercury in minute doses is that, while acting in minute doses as a specific, it has the great advantage to the patient of being at the same time tonic.

Now, the ordinary tonics—such as the long list of vegetable bitters, the quinine group, iron, and analogous drugs, together with cod-liver oil and similar blood-formers—all of these serve a good part in the treatment of syphilis, just as other hygienic means do. If employed with intelligence and judiciously changed, they in a measure take the place of change of air and selection of food, in those cases in which lack of money will not allow the patient to alter his food or to get a change of air. Cod-liver oil is a particularly useful adjuvant to treatment in those cases in which the blood-making powers are defective, while the ability to digest fat remains.

In persons who lack blood, yet in whom the stomach refuses to accept or to assimilate so concentrated a food as cod-liver oil, an excellent substitute is found in kumyss.

Kumyss, long known and extensively used in Europe, especially in Russia, is fermented milk. In different countries it is made out of different kinds of milk—that of asses, mares, cows. In America, I believe cows' milk only is used. This milk-beer is not unpleasant to the taste. It resembles buttermilk well aërated with carbonic acid, more than any-

[1] The Effect of Small Doses of Mercury, etc. Am. Journ. Med. Sci., January, 1876.

thing else. It is exceedingly light to the stomach, and seems not only to digest itself (by the lactic acid it contains), but to help digest other food. It constipates little or not at all, and does not, generally, produce headache, as milk often does. It may be taken in indefinite quantities, but a pint to a quart a day is enough for most people. It is an excellent remedy in dyspeptic conditions, and generally agrees with a weak stomach, whether the latter be due to syphilis or to other cause. Often, where cod-liver oil cannot be taken, and milk does not agree, kumyss comes to the rescue and helps to turn the scale in the patient's favor. Kumyss is, of late years, extensively manufactured through the country, and may be easily obtained in our larger cities of the East. It bears transportation moderately well, but must be kept cold. Its management is rather difficult as put up by some manufacturers, on account of the amount of carbonic acid gas which it contains. I generally direct that a champagne syphon be used to draw it from the bottle, and that the kumyss be taken as a beverage, with or just after meals—one or two claret-glasses at a meal, according to the patient's fondness for it, and its effect upon him. An appetite for the drink is generally soon acquired.

SPECIFIC TREATMENT OF SYPHILIS.

The specific treatment of syphilis is a treatment of the disease by those drugs which are known commonly to control the symptoms in an immediate manner. These drugs are many of the preparations of mercury and of iodine. The latter are found to exercise much less influence over the symptoms of early syphilis than mercury does; but, in revenge, they possess a controlling power over many of the tertiary manifestations of the disease, particularly over those dependent upon gummatous deposit, no matter in what tissue such deposit occurs.

Mercury, on the other hand, has undoubted value in all stages of syphilis and over all its lesions, but less control over gummatous deposit than over other lesions. Indeed, although sometimes it will (in form of fumigation) influence a gummatous lesion (ulcer, for example) more positively and more promptly than the iodides, yet, as a rule, it cannot be relied upon to overcome symptoms due to gummatous deposit. The iodides, in such cases, serve an excellent part to supplement the action of mercury just here where it is the weakest. In treating a gumma, the object is to dissipate the deposit as promptly as possible, so as to save the tissues involved from damage by pressure, or by disintegration when they are included in the gummatous mass; and this the iodides do speedily if vigorously pushed and well borne by the stomach, while the mercurials will often fail to do it.

The iodides, on the other hand, have little or no power to prevent relapse; and, when they have done all their work, mercury often has to be called in to endorse the cure and to prevent a return of the symptoms. Thus the two specifics support each other.

These facts I think I have demonstrated in an essay on the "Internal Treatment of Syphilis," read before the Medical Congress in Philadelphia, in 1876, and contained in the printed transactions of that body. I therefore judge it to be unnecessary to reproduce the line of argument here.

It is also equally foreign to a book of this character to go deeply into the detail of scientific work. I shall therefore say little or nothing about

the counting of blood-corpuscles, and the steps which lead directly to the conclusion that mercury is a tonic when administered in minute doses, no matter over what length of time its administration may be continued. This conclusion I believe I have demonstrated to be a fact in the essay already alluded to upon the "Effect of Small Doses of Mercury in Syphilis," which appeared in the January number of the American Journal of Medical Sciences, in 1876. Those interested in following the study of the blood and the course of argument derived from other facts which prove that mercury in minute doses long continued is a tonic, while in large doses it is atonic, diminishing the number of the red cells in the blood, are referred to the two papers in question. There I think it will be found to be demonstrated that mercury, properly used for a number of years in succession, cannot do any harm to a patient, while it certainly, in most cases, controls his symptoms in a greater or less degree. I have but to add here that the years which have passed since the appearance of those papers have only served to strengthen my convictions in the correctness of the conclusions there reached. The only modification I have made has been to somewhat diminish the dose of mercury for continuous use, making the tonic dose more often one-third rather than one-half of the full dose; and, in revenge, I am inclined to extend the treatment into the fourth year in a majority of instances, where such prolonged treatment is practicable.

Relapses certainly do occur after this time, but, in my experience, they have been invariably mild, and have come readily under the control of specific medication. Mouth symptoms during this course are generally more obstinate than any others, but I look upon the little scaly patches upon the tongue and lips more as an evidence of local irritation, in a person once syphilitic, than anything else, and I am now in the habit of treating them locally in many cases, without making any change in the internal dose which the patient may be taking at the time.

The coup sur coup plan of giving mercury I have never followed up, being satisfied, from the results in the way of relapses I have seen in patients who have so taken the drug at competent hands, that this form of treatment leaves much to be desired. The plan known as Fournier's treatment, which consists in the interrupted use of mercury in mild form (a gentle coup sur coup method), with stated definite intervals in which no treatment is used, seems to me to rest upon no foundation stronger than theory, since syphilis, a malady of interruptions undoubtedly, has its interruptions at indefinite and irregular intervals. Notwithstanding that intervals of latency in the malady exist, periods of apparent immunity from the disease, yet there is nothing to prove that the patient is free from the poison during those intervals, but everything to show that he is still suffering. The cauterisatio provocatoria of Tarnowsky (p. 78) is founded upon this assumption. A blister or a local irritant (vaccination) will sometimes make latent syphilis active—a woman seemingly perfectly healthy will often produce a syphilitic child. What conclusion can therefore be reached except that syphilis is a mild, continuous disease, with periods of passive latency and periods of active outbreak; and what treatment, therefore, recommends itself more to common sense than a mild, long-continued, uninterrupted treatment by a specific known to have power over the symptoms, with an increase in the quantity of that specific during the periods of outbreak?

And this becomes especially apparent when it can be shown, as I think I have done, that the continuous use of the mild specific acts as a general

tonic (as well as performing its work as a specific) during the whole period of its administration.

The method I propose, indeed, has all the advantage of the coup sur coup method, but its *coup* is mild. It hurts only the disease, never the patient. The "blow" falls only during the period of active outbreak of the disease, while the general treatment has the further advantage of acting continuously as a specific in eliminating the poison of syphilis, and preventing it from causing outbreaks in the way of serious symptoms. This treatment constantly tends to keep the disease down, and to keep the patient up. It does not cure the disease so much as it conducts the patient safely through the periods of the disease. It does not prevent relapse later in life with certainty, for occasional cases of such relapse do certainly occur; but it ensures one, I believe, more positively against relapse, than any other form of treatment—at least, than any other with which I am familiar.

Salivation I believe to be harmful. Much of the odium which rests upon mercury is undoubtedly due to the harm it has done to the mouths and stomachs of patients in times past, by salivation. In the days when it was considered that the patient never had arrived at his proper dose of mercury until he was caused to spit at least a pint in twenty-four hours, how much damage must have been done, and how justly has mercury paid the penalty by falling into popular disgrace, and by being distrusted by a large number of intelligent gentlemen, in the profession as well as out of it.

That salivation may occasionally do good in desperate conditions of disease late in syphilis, I do not deny; but certainly it has no value as a means of general treatment, and I think it can never happen to a patient early in the disease without doing him positive harm.

The time at which the general treatment of syphilis shall be commenced is a question of great importance. Unquestionably it should be commenced as soon as the disease is diagnosticated; but the difficulty is that diagnosis, before the eruptive stage—positively absolute diagnosis—is rarely possible without confrontation, and even then there is a chance for error found in the possibility of infection through another source, or in mediate contagion.

Practically, therefore, the treatment should not be commenced until the first general symptoms of syphilis appear; the chancre with the accompanying glandular engorgement is not enough to go by. If treatment is commenced while any doubt exists, that doubt remains, and the patient may continue in doubt for the rest of his life, to his great discomfort; therefore, although he may demand treatment, and beg for it when he has a chancre, the surgeon will do him a kindness by refusing internal specific measures until the first general symptoms begin to appear.

In the rare cases in which diagnosis can be positively made, without the chance for the least possible doubt—as, for instance, when a husband poisons his wife or his child—treatment may and should be commenced at once, without waiting for general symptoms; otherwise it is safer for all parties to wait. The patient's mind may be satisfied, meantime, by cutting out his chancre, and he may be medicated, to his advantage doubtless, with tonics of all kinds; but mercury should be denied him.

I have in the past often deviated from this rule, and probably with advantage to the patient in most instances; but occasionally I have encountered a case which has afterward given me much anxiety, and made me doubt my diagnosis greatly. Such cases always make one feel the ad-

vantage of a rule which forbids any specific treatment until general symptoms have declared themselves. In one case which I remember well, there was no possible room for doubt about the patient's syphilis. Every physical feature of the sore was perfect, the incubation accurate, the inguinal pleiad typical; and, at the patient's urgent request, I commenced treatment. All went well for a year, but not a solitary symptom of syphilis appeared. During the second year, treatment having been kept up continuously, and the patient being in perfect health, my faith began to waver, and for several months I thought it possible that I had made a mistake, and that my patient had no syphilis at all. I finally appointed a night, and told him that, if no symptoms of syphilis had appeared before that date, I should stop all treatment. Fortunately for the patient and for my diagnosis, at his next visit he showed me a most characteristic mucous patch upon his throat, and the treatment was continued. Much anxiety in this case, both on the part of the patient and of myself, might have been avoided by waiting six weeks or two months after the chancre, before commencing treatment.

DETAIL OF THE TONIC TREATMENT OF SYPHILIS BY MERCURY.

I have called the method about to be described the tonic treatment of syphilis, to distinguish it from other methods. It is tonic, and therefore the term is correct; but it does not cure syphilis because it is tonic. It cures the symptoms because it is a specific, and the tonic action is only an accidental one found to attach to the method. Even if it were not tonic, it would be proper to use mercury in the treatment of syphilis; and indeed, mercury often is given, and properly given, in such a way as to be a specific devoid of tonic properties, in that it is used in large doses—doses which I have shown by blood counting to be anything but tonic. When, however, the specific medicine can be used so as to be at the same time a tonic, I think that a step in advance over the older methods has been made, and that is the reason why I have called this method the "tonic treatment of syphilis."

The idea of this treatment is best carried out by using the same drug continuously in varying doses. If the preparation has to be changed and great accuracy is aimed at, it is necessary to make a new set of tests in order to find the tonic dose. The preparation which I have used the most, and with which I am entirely satisfied, is the proto-iodide of mercury put up in France by Garnier and Lamoureux, in the form of sugar-coated granules, containing exactly one centigramme each ($\frac{1}{6}$ of a grain). The advantages of this preparation are that it does not change by climate; the proto-iodide remains fresh inside the sugar coating, and the latter, being thin over the small granules, always dissolves in the stomach readily; the preparation is a solid one, and easy to carry around, and to take without causing comment; a liquid might be used, but it would be harder to manage; the quantity of the drug in the pills (one centigramme) seems to be reliable, and to be accurately graded in the different pills; the preparation is clean and dry, and many doses may be carried in a little box or bottle in the pocket, without taking up much room; finally, this preparation has very little of the griping quality possessed by many specimens of the proto-iodide found in the shops. The French granules are quite cheap.

Many preparations doubtless possess all the good qualities I have ascribed to Garnier's granules; but, having been well served by these, I have not thought it well to change. A number of American manufac-

turers now make gelatin-coated granules of proto-iodide of mercury in doses of gr. $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{6}$, and many of them are good preparations. They may be obtained anywhere in the country.

In some cases the proto-iodide produces griping pain in the intestine, even when it is given in very small doses; but these cases I find are quite rare when the French granules are employed.

Other preparations of mercury, however, must be at hand to be employed when the proto-iodide does not agree. Perhaps the drug most bland and most certain to be found everywhere is blue pill. The size of pill most convenient for use I find to be one-half a grain, and these may be made up alone, or combined with a fifth, a quarter, or a half-grain of the dried sulphate of iron, according to the formula so long successfully in use by the profession.

If pills are objected to by the patient, he may take gray powder, the standard powder to use in finding the dose being one-third or one-half a grain; or, if liquids must be taken, owing to the patient's caprice, I know of no improvement upon the old-fashioned combinations of corrosive chloride with compound tincture of cinchona, or, if iron be needed with the tincture of the sesquichloride of iron, the dose being so regulated that one-fiftieth, or, perhaps better, one-hundreth part of a grain of the bichloride shall be the standard dose until the tonic dose has been found out.

In short, any preparation or combination of mercury may be used, provided it does not contain opium, the addition of which would make it impossible to decide accurately what the tonic dose is. The standard dose must be a minute one.

To bring a patient under the tonic treatment, if there be time, the following is the best course: Let him take one standard dose of mercurial (one granule of the proto-iodide, for example) after each meal for two or three days. On the fourth day one extra standard dose is added at the mid-day meal; now four standard doses (granules) are taken daily, and this is to be continued for three days.

On the succeeding fourth day another standard dose is added, the five daily standard doses being taken two in the morning, one at noon, and two at night. On the next following fourth day, always counting from the last fourth day, another dose is added, two standard doses being now taken after each meal—six (granules) a day.

In this way the amount of mercurial given is gradually increased, while the patient uses bland food in moderate quantity and regulates his habits as far as may be, and the dose is slowly increased every third or fourth day, or even every second day, if the patient is pushed for time and the presence of an eruption makes haste an object, until the irritating or the poisonous action of the drug begins to manifest itself.

If in any given case the symptoms are so pressing that there is not time to get the patient quietly under this treatment, there is no objection to treating him by any of the older methods until his symptoms abate. He may be rapidly brought under the mild influence of mercury until the drug shows faintly along the edge of the gums, either by inunction, by daily fumigations, or by gr. $\frac{1}{16}$ doses of corrosive chloride in tincture of bark, taken diluted, after meals; and when finally the urgent symptom has fairly declined, all medication may be suspended for a week or more, and then under less pressure the mercurial course may be instituted as directed above.

One advantage of the French proto-iodide granules, which was not alluded to above in the list of its virtues, is that, although it does not

gripe when given in small quantities, yet it does show its irritating effects, usually, upon the intestine, before it produces any trouble in the mouth. This is not always the case, but it is the rule; consequently, during this course of granules, diarrhœa and griping pain are to be watched for. A slight looseness of the bowels is unimportant. Such a looseness often comes on during the early days of the course; but, by holding the drug at the same dose, it subsides, and then the doses may be increased as before.

When a dose of six to nine, or even twelve granules a day in some cases, has been reached, it will produce a very positive attack of diarrhœa, with pain in the intestines; and occasionally at the same time the breath will begin to have the mercurial fetor, and the livid line will begin to show faintly along the edge of the gums at the necks of the teeth, while the teeth themselves become a little sensitive on being snapped sharply together, and the saliva flows more freely. These latter symptoms are generally not much marked with the proto-iodide, and they may be absent entirely while the griping and diarrhœa are quite positive, and this feature I consider an advantage in favor of the proto-iodide.

When either of these sets of symptoms occur, the patient has reached his limit. He is taking what I have called his "full dose"—a dose which he may continue to take with the aid of selected food and a little opium, and may, indeed, in most cases, continue to take without becoming salivated. This dose is anything but tonic. If it be continued, the patient surely suffers in time, both in the stomach and in the quality of his blood, while his strength and physical powers are diminished by it. This "full dose," therefore, is only to be used in case of necessity. It is specific, and possesses fully the antagonistic influence to syphilis which the mercurials enjoy; and the patient may take this dose for a considerable period without injury, if his symptoms require it, with the aid of a little opium to give him comfort, or, I think, preferably without opium, by changing his food, drinking boiled milk, and eating rice.

This "full dose," the size of which varies greatly in different individuals, may be maintained until the activity of any existing symptoms declines, and then it should be dropped, and the "tonic dose" of mercury substituted.

One-half of the "full dose" is a "tonic dose," and may be continued steadily during several years without injury to the patient; if anything, apparently rather to his advantage, for he feels well under it in most cases, he eats well, his functions go on perfectly, and his blood is richer in red corpuscles than it was before. The condition is an unnatural one, however. Nature is being outraged by the constant use of a foreign substance, the use of which is only allowable in order that it may counteract another foreign substance—the poison of syphilis—and the less of the drug that can be used with safety to the patient, the better. Therefore, of late years, I have been in the habit of using, as a continuous dose, a quantity somewhat smaller than the regular tonic dose—a quantity, for instance, equal to one-third instead of one-half of the "full dose." This dose is also tonic, and with it I endeavor to persist without interruption, for a long period of time, in the endeavor to eliminate the syphilitic poison gently, and to keep its explosive outbreaks within reasonable limits. The idea of the tonic dose is that it shall be continued daily, year in and year out, for, in round numbers, about three years, or longer—alterations, of course, being occasionally made meantime, according to the varied necessity of the different cases.

During the existence of all ordinary moderate symptoms, isolated patches of eruption, disappearing general eruptions, mucous patches, etc., the tonic dose may be maintained unvaried, or slightly increased, according to the surgeon's judgment, while local measures are brought to bear upon the local lesions. If more severe symptoms come on at any time, the tonic dose may be immediately increased to the full dose, already ascertained; and after the full dose has done its work, it in turn may be again dropped to be replaced by the tonic dose. In these emergencies, instead of increasing up to the full dose, the tonic dose may be maintained, and inunction or fumigation resorted to until the emergency has passed.

These simple directions meet the wants of most cases, until some tertiary symptom arrives—if, indeed, any tertiary symptoms at all come on, for they may be escaped entirely. Tertiary symptoms call for a variation in the general treatment. The mercury may be dropped entirely, one of the iodides being substituted if the lesion be purely gummatous; or the mixed treatment may be called for, according to the symptom. Under the heads of the various symptoms, it will be indicated which of the special forms of treatment is required. When the mixed treatment is indicated, one of the best combinations is a solution of the biniodide of mercury in a solution of the iodide of potassium. This is a reasonable chemical combination. The granules of the proto-iodide may be continued, if thought best, while the iodides are given separately; but this treatment may result in the formation of a certain amount of the biniodide of mercury (a very active preparation) in the stomach, and the other course is therefore preferable.

After the mixed treatment or the iodides alone have accomplished what was expected of them, it is well that the patient should return again to his tonic dose of the granules, and continue them until it is thought best to stop all treatment.

In case of any intercurrent malady not syphilitic in nature, coming on during a long mercurial course, the latter may be stopped at once and resumed when the intercurrent malady has passed away. The mercury should be stopped also during any attacks of acute indigestion, diarrhœa, and the like.

The time at which a tonic course of the mercurial specific may be stopped.—This, like all other points in connection with syphilis, is subject to variation. About three years is a full course for most people, while two years and a half, or even two years, answers well enough in some cases. Six months of entire immunity from symptoms, at the very least, or, better still, a year's freedom from evidences of the disease, is desirable before the tonic treatment is stopped. In some cases where smoking is persisted in, an occasional scaly patch on the side or tip of the tongue, or inside the lips or cheeks, need not be regarded as a symptom serious enough to make the six months test invalid. It is better that no symptom whatsoever suggesting syphilis should have occurred; but it becomes a matter of special judgment in some cases whether the persistence of these mild mouth lesions, for cause (smoking), may not be disregarded, provided there is and has been nothing else about the patient for a long time to suggest the persistence of the existence of syphilis. Occasionally, non-syphilitic patients are found in whom smoking will produce erosions and scaly patches within the mouth absolutely identical with the lesions found in syphilis. Should such a patient get the disease, it is not fair to let his constitutional peculiarities be ascribed to a syphilitic cause.

If relapses occur after the cessation of treatment, they must be managed according to their necessities, generally best by the mixed treatment; and then, finally, a tonic mercurial course may be instituted for a few months, more or less, according to the judgment of the surgeon, and proportionate to the intensity of the relapse and its obstinacy.

Many patients will not follow continuously the strict course which has been detailed; but many others do follow it conscientiously, the more readily as they are intelligent and have the nature of the disease explained to them, together with the theory of the treatment.

CHAPTER VII.

THE GENERAL TREATMENT OF SYPHILIS—CONTINUED.

Mercurial Fumigation.—Simple Method of taking a Bath at Home.—The Inunction of Mercury.—Other Methods of giving Mercury.—The Treatment of Salivation.—The Local Treatment of Syphilitic Lesions of the Integument; of Mucous Membranes.—The Iodides and the Preparations of Iodine.—The Evil Effects of the Iodides.—The Dose of the Iodides.—The Mixed Treatment.—When to cease giving the Iodides.—Zittman's Decoction.

Mercurial fumigation.—Before making use of the standard dose, in order to find the full dose, and the tonic dose, in a particular case; or, after the tonic dose has been ascertained and where it is desirable to suddenly increase the mercurial influence in order to counteract sone tendency to activity on the part of the syphilitic symptoms—instead of putting the patient upon his full dose of mercury, he may be retained at the tonic dose, and the mild but certain influence of mercurial fumigation brought to bear upon him.

Mercury in vapor acts very promptly and very kindly. The obstacles to its extended use are the difficulty of its application, the time required to give a bath, the impossibility of using it secretly at home (for syphilitic patients are always shy of being discovered while taking medicine), and the expense if the baths are taken in an outside establishment.

The value of the vapor, however, is so considerable, in many cases, that its use for emergencies should be placed within the reach of all. In many ulcerated and pustular lesions, and in cases where persistent and chronic relapse occurs in a patient with irritable stomach and general debility, the vapor-bath renders invaluable service. When pushed too far, mercurial vapor may cause salivation or diarrhœa, but it rarely does so when watched; a sense of weakness, with general depression, attended by more or less trembling (perhaps positive mercurial tremor), is one of the more common indications that the baths are being pushed too rapidly.

In a regular mercurial bathing establishment, the patient sits naked in a box, sometimes with the head in (if the fumes are not disagreeable and do not induce coughing), sometimes with the head out. A little steam is let into the chamber, the temperature is raised to 90° F. or thereabouts, and when the body is damp and warm, the mercurial to be used is volatilized, and, permeating the chamber, settles upon the moist skin, where it becomes precipitated—changed probably into the bichloride by contact with the perspiration, and as such absorbed. If the head is in the fumigating chamber, a certain amount of the vapor is directly absorbed by the lungs.

Fifteen to twenty minutes is ample time for such a bath, which should be terminated sooner if the patient grows faint. The best form of mercurial for the bath I believe to be the black oxide, in a dose for volatili-

zation, at first, of one drachm, afterward of two drachms. Calomel is often used, and the sulphuret of mercury, in doses of ʒ i.; but both of these substances irritate the lungs of some patients, and may induce violent coughing. When they are used, therefore, the head should be kept outside the fumigating chamber.

Twice a week is generally often enough to repeat the bath. In some cases, where they are well borne, I have repeated them daily, for a time, watching the patient carefully for the effect of mercury.

After the bath the patient should wrap himself up in a warm blanket, and rest quietly for an hour or more, until he has become thoroughly dry without the use of a towel.

The form of bath above described is a good one, but it is an expensive luxury, and not to be obtained at all by patients in the country. Under circumstances calling for a bath, where the bathing establishment may not be suitable, an excellent substitute, answering all purposes, may be taken by the patient in his own house, at a merely nominal cost. The appropriate essentials for such a bath are: an alcohol-lamp with one or two good burners, and a piece of tin bent into the form of a table (Fig. 1), of such height that the flame will spread itself evenly upon the under surface of the tin. The figure represents the flames of the lamp as being by far too small. I have found upon such a table, that one good flame of a spirit-lamp will volatilize half a drachm of calomel in four and one-half minutes, and the same amount of cinnabar in six minutes. One flame is therefore ample, and it need not be a very large flame if the sheet of tin be reasonably thin.

Fig. 1.

Both calomel and cinnabar volatilize quite easily by this method; the oxides require more heat and more time. I have sometimes used gray powder, which does very well. Both calomel and cinnabar (and especially the latter) may cause coughing, but generally the bath can be so managed that the patient is not materially discomforted by it. If cinnabar be used, the patient may keep his head out, and retire into another room immediately after the bath. On the whole, my experience leads me to prefer calomel in this form of bath, commencing by volatilizing a powder of twenty grains, and working up to a drachm.

Domestic vapor-bath.—The simple method of taking the bath is as follows: the patient sits naked on a cane-bottomed chair, holding close around his neck, under his chin, a couple of blankets, which may be pinned in place so as to envelop the patient and the whole chair down to the floor. Under the blanket is placed the little tin table beneath the chair, with its spirit-lamp unlighted, the dose of calomel lying on top of the tin table. Under the chair, also, is placed a pan of hot water.

The patient sits quietly over the hot water until his skin has become warmed up and slightly moist, then he stoops down, lights a match, lifts the edge of the blanket, and lights the spirit-lamp. He may leave this light burning until the bath is finished, if he desires, or he may extinguish it in five or ten minutes, according to the amount of calomel to be volatil-

ized and the degree of heat he experiences. He then sits quietly for perhaps ten minutes longer in the fumes, occasionally opening the front of the blankets to breathe a whiff, if the vapor does not irritate the air-passages, and his bath is over. He now wraps himself up in the inside blanket in which he has taken his bath, and remains so wrapped, lying down until he has cooled off, after which, without using a towel, he goes to bed. In the morning he may take a soap and warm water bath if he desires it.

The effects of mercurial vapor by inhalation may be obtained when a patient is unable to leave his bed, by volatilizing calomel or cinnabar near his nose upon a sheet of tin, or even upon a hot brick. Inhalations of this sort are of incalculable value in some cases of mouth and throat lesions, when the patient can make the inhalations without coughing, which he generally can do if they are commenced mildly and often repeated, minute quantities of mercury being volatilized at a time.

These simple means place the mercurial vapor within the reach of all; and I think the more the vapor is used in emergencies, the more highy will it be esteemed.

MERCURY BY INUNCTION.

Inunction is the best method of introducing mercury into the bodies of infants, and many believe that it is the best method in the adult. The main objections to it are that it is dirty, and so irritates the integument in some cases that it cannot be used for any great length of time. Where it agrees it is an excellent method, especially to use in conjunction with the tonic internal treatment, to meet such emergencies as call for an increase in the amount of the mercurial employed. It is as good a method as that by fumigation, for sparing the stomach, and is very useful in those cases in which that organ must be restricted to its natural function, the digestion of food. It has the advantage over fumigation that it may be carried out in the utmost secrecy.

There are many methods by which mercury may be introduced through the skin into the blood. Ordinarily, the process is one of friction; and in this country the patient generally does the rubbing for himself, with his own bare hand. In some parts of the world inunction is practised by professional rubbers, who often wear gloves.

The amount of absorption which takes place by the skin is very variable in different individuals. A prompt effect is produced in some patients, a very slow effect in others; consequently, where the course must be long or the dose at all accurate, this method is obviously inappropriate. Moreover, skins differ materially in their irritability upon the contact of mercurial preparations. Some patients will wear a patch of mercurial ointment bound upon the skin for weeks without showing any local redness of the skin, while in others each inunction is followed by local redness and itching, and a persistence of the application by an outcrop of the so-called mercurial eczema which distresses the patient considerably by its itching, and is, relatively, quite chronic in character and slow to disappear.

In the friction method of inunction three preparations are in common use: mercurial ointment, the different oleates, solutions of corrosive sublimate. Of these three the mercurial ointment is cheap, most easily procured, and generally preferred. Corrosive sublimate is cheap also and clean, but the element of danger which its use involves is a bar to its general employment. The oleates are nicer preparations, but are more expensive.

When mercurial ointment is to be rubbed in, from half a drachm to a drachm is a dose, to be used once daily, preferably at night. The skin to be anointed should be thin, for the absorption of mercurial ointment is not active ; therefore, the flexures of the various joints are usually chosen, although any part of the integument will answer. Thus, Sturgis, of New York, prefers the soles of the feet, and the patient does his own friction while walking about.

The portion chosen for inunction is to be slowly and firmly rubbed with the ointment by means of the bare fingers or the whole hand, for something like twenty minutes or half an hour, preferably at night. The task is laborious if properly done. After rubbing the ointment in as thoroughly as possible, the part may be bound up in dry flannel and left for twenty-four hours, when it should be carefully washed with soap and warm water, and another friction performed upon another portion of the integument. By the time all the flexures of the joints have been gone over, the spot first used will be ready for service again, and so on until the occasion for inunction ceases.

When the oleates of mercury are used, the five, ten, or twenty per centum preparations may be employed, according to the irritability of the skin and the effect it is desired to produce.

The twenty per cent. preparation is most commonly employed. It is absorbed more easily than mercurial ointment, and, therefore, has more effect; but it is equally irritating to most skins. It may be rubbed in anywhere upon the surface, commencing with a half-drachm dose and increasing to a drachm, and treating the surface in all respects as has been suggested above for mercurial ointment. If mercurial eczema occurs, it may be treated with any bland ointment—oxide of zinc, for example. The five per centum oleate may be rubbed upon the spot daily, in many persons, without creating any marked disturbance of the skin.

The process of cutaneous application of the bichloride of mercury is to simply wash the skin with a watery solution of corrosive sublimate and allow it to dry on. From one-quarter to one-half a grain, or more, may be used at a time in this way, dissolved in a dessert-spoonful or a table-spoonful of water. It is dangerous to use an actively poisonous drug in such quantities generally, especially if there be any erosions of the skin, such as might be found in an early general syphilitic eruption. Detmold, of New York, praises this plan highly.

Corrosive sublimate is used in a full bath sometimes, especially for children; but it can hardly be safe for general adoption.

Teale's method of inunction, as it is called, consists in binding upon an arm or a leg a piece of bandage (or flannel cloth), upon which mercurial ointment has been thickly smeared. The bandage is kept in place at discretion, the surface of the skin beneath it being inspected daily, and the bandage removed and placed elsewhere when the skin begins to show any signs of redness, or the patient complains of local itching. By this means there is a continuous action of the mercury upon the skin day and night, until the ointment dries up, when it must be freshened with oil, or a new plaster applied.

This method is mild and continuous in its action, and with certain skins works admirably.

Of the other methods of introducing mercury into the body, that by rectal suppository, which has been abandoned by its originator, Zeissl, is not so good as by the skin or by fumigation; and that by subcutaneous injection, even of the albuminates of mercury, though undoubtedly prompt

and effective, is painful, and apt to be followed by local inflammatory indurations, and even abscesses, which practically make it unsuitable for general use, even during emergencies, since we possess so many better methods.

The direct local influence of mercury has been proved by subcutaneous injection of the drug, since it has been found that, if a patch of eruption be injected, it gets well, while a similar patch, more or less distantly situated, is not modified by the general effect upon the system of the small amount of mercury employed.

Among the special methods of giving mercury, the plan known as Trousseau's must not be forgotten. By this plan minute doses of calomel, anywhere from the sixtieth to the tenth of a grain, are given hourly, or at short intervals, with great effect in some cases in overcoming the intense headache of early syphilis, and for the purpose of rapidly bringing a patient under the full influence of mercury. One-tenth of a grain, hourly, will show in the mouth, in the case of some patients, within twenty-four hours.

THE TREATMENT OF SALIVATION.

In a properly regulated treatment salivation should never occur. In ascertaining what the "full dose" of mercury is in a given case, the gums may be touched, as the expression is; but this condition cannot fairly be called salivation, although it is the first stage of it. In maintaining the full dose, the mouth is kept constantly in a condition of mild irritation, and necessarily so, in some instances, when the symptoms are severe. Under these circumstances, especially if it seems probable that the full dose will have to be maintained for a considerable period, certain precautions should be taken with the mouth in order to allow the mercury full chance without in any way encouraging its disagreeable effect upon the mouth.

The teeth, it is presumed, have been properly attended to, and the tartar removed by a dentist. All the precautions detailed in speaking of the hygiene of the mouth (p. 112) should also be put in force. Besides these precautions, only three others need to be insisted upon; they are: the bath, a diuretic, and the internal use of the chlorate of potash.

The bath should be used quite hot at night, and the patient advised to remain for a number of minutes in the warm water. Then he should dry his skin under very smart friction with a soft towel. In this way the circulation of the skin is rendered active, and the dead epidermis rolled off in quantities by the friction. The function of the skin as an excretory organ is intensified, and more mercury than usual escapes in this direction, thus taking off some of the work from the mouth.

A diuretic acts in the same way, increasing the excretory activity of the kidney, and allowing more mercury to escape from the body by this channel.

Finally, the well-known soothing influence of the chlorate upon the irritated mouth and fauces should be called into play. About a drachm of the chlorate of potash in twenty-four hours is generally enough to be taken.

℞. Potass. chlorat..... ʒ i.
Aquæ gaultheriæ..... ℥ iij.
M.
S. Teaspoonful hourly in a tablespoonful of flaxseed tea.

If double doses are taken in the early morning and during the evening, about the proper amount in the twenty-four hours will be consumed.

As salivation approaches, the signs noticed, as indicating that the gums are touched, become intensified. The stale odor of the breath becomes positively offensive, quite peculiar and characteristic—the mercurial fetor, as it is called. The tongue becomes heavily coated, and the peculiar, bitter, coppery taste of which the patient has been complaining, grows sensibly more intense and more disagreeable, especially upon awakening in the morning. The gums grow puffy, soft, and fungating along the line of the necks of the teeth, more livid in color, bleeding easily upon the lightest touch, as during brushing the teeth, even with the softest tooth-brush. Finally, the flow of saliva grows more and more profuse, partly watery and partly tenacious. It flows over upon the patient's chin, and soils his clothes. At night it runs out from the angles of his mouth, and wets his pillow. With these signs the stomach is often badly upset, diarrhœa comes on, the complexion becomes pallid, livid, the appetite fails, and headache is often present, with great depression of spirits.

At last the tongue may swell so as to be too large for the mouth, and with it the lips and cheeks become tumid. Ulcers appear all over the inside of the mouth and along the gums. The purple gums bleed freely, the loosened teeth project, and drop from their sockets, while more or less extensive portions of bone, or of the soft parts, necrose and slough away.

Such an intense condition of salivation as that last depicted is very rarely encountered at the present day, but it need not be waited for; all conditions of active salivation demand prompt measures for their relief.

All the means of relief already detailed under the head of hygiene of the mouth, p. 112, and directed for the restraint of salivation when the gums are mildly touched, should be kept in force, as far as may be, and atropine used in solution under the skin.

No one remedy perhaps acts as kindly as this. Of the following solution—

℞. Atropiæ sulph ..... gr. i.
Aquæ ..... ℥ i.
M.

five minims may be thrown under the skin, the effect upon the pupil watched, and the dose repeated every four to six hours, until the pupils are widely dilated. The effect of this remedy upon the salivary secretion is often very prompt, and the general influence over salivation quite marked.

Chlorate of potash in solution, in cold tea, about one or two drachms to the pint, with a scruple of carbolic acid, according to the sensitiveness of the swollen mouth, should be constantly used as a mouth-wash, and gradually, as they can be borne, stronger and more astringent washes. To all of these a little carbolic acid should be added, for the mouth and its secretions are most foul and need sweetening greatly. A reasonably good mouth-wash is the following, diluted at first with warm water, should it prove too astringent:

℞. Acid. carbolic ..... gr. x.
Acid. tannic ..... ʒ i.
Tr. myrrhæ ..... ʒ ij.
Potassæ chloratis ..... ʒ ij.
Mellis ..... ℥ ij.
Aquæ menth. pip. ..... q. s. ad ℥ viij.

Labarraque's solution diluted, or a mild solution of borax or of permanganate of potash, may be used as a substitute for the carbolic acid preparations should the latter be offensive, as they are to some patients.

Diarrhœa in these cases may be disregarded, unless it is exceptionally severe. Nourishment must be maintained mainly by milk, eggs, soups, and soft food.

THE LOCAL TREATMENT OF SYPHILITIC LESIONS.

The local treatment of syphilis, although subordinate to the general treatment, is nevertheless of great importance in many cases. This is especially true in regard to mouth lesions, and those occurring about the anus and genitals in either sex. It is often equally important in connection with a general syphilitic eruption, where spots on the face and on the hands must be removed with all possible speed, and in some cases of ulcers which require local as well as general treatment for their prompt removal.

In connection with a description of the varied local lesions, some of the local measures of treatment most appropriate to them will be alluded to; but, for the sake of avoiding endless repetition, it is well to group under one head all general remarks about the local treatment of the varied lesions of syphilis, only repeating afterward where the treatment is to be emphasized.

In general, then, it may be said that all the local expressions of syphilis should be treated with respect, not irritated by much handling, by dirt, by allowing the secretions to be retained and to undergo decomposition. Ulcers should be kept clean, discharges of all sorts should be frequently washed away, tobacco prohibited where mouth lesions exist.

LOCAL MEASURES APPLICABLE TO LESIONS ON THE SKIN.

The local treatment of chancre is detailed along with the description of the lesion. The early general eruptions require no local treatment other than cleanliness, unless it be for such portions of the eruption as appear upon the face and hands. These portions, therefore, may be treated topically while the rest of the eruption is allowed to subside under general medication.

The best topical applications for all the forms of secondary and intermediary syphilis appearing upon the skin are the different preparations of mercury. Most of the tertiary lesions do well also under a local use of the mercurials; but some ulcerative forms seem to thrive better when dressed with iodoform or choral.

The mercurials, to be effective of good by local application, should be graded in strength so as to stimulate without irritating the surface. Consequently there must be a range in the strength of all applications employed, and it is well in a given case to begin with a mild ointment, increasing its strength according to its effect. Dry lesions call for more strength in the local application than excoriated surfaces require.

The preparations from which I have derived the most service are the following:[1]

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[1] Most of these have appeared in a monograph on the "Tonic Treatment of Syphilis," published in 1877, p. 76.

℞. Hydrarg. oleat..... 5 or 10 per cent.

Or—

℞. Hydrarg. chlorid. corrosiv..... gr. i.—v.
Glycerinæ..... ʒ ss.
Spts. rect.,
Aquæ ros.....āā ℥ ss.
M.

Or—

℞. Hydrarg. chlorid. mitis..... ʒ i.—ij.
Ungt. aquæ ros.[1]..... ℥ i.
M.

Or—

℞. Hydrarg. ammoniat..... ʒ i.—ij.
Ungt. aquæ ros..... ℥ i.
M.

Or—

℞. Hydrarg. oxid. rub..... ʒ ss.—ij.
Ungt. aquæ ros..... ℥ i.
M.

Or—

℞. Ungt. hydrarg. nitratis..... q. s.

To be used in the beginning much diluted.

Or—

℞. Hydrarg. iodid. virid..... gr. xv.—l.
Ungt. aquæ ros..... ℥ i.
M.

Or—

℞. Hydrarg. oxid. flav..... gr. xx.—ʒ iss.
Ungt. aquæ ros..... ℥ i.
M.

Among these preparations, perhaps the best are the lotion of the bichloride, the white precipitate and the citrine ointments. One or the other of them will be found to serve a good purpose in the case of the different cutaneous lesions, dry or moist. The bichloride solution, I think, acts best for dry, scaly patches upon the palms or elsewhere.

Mucous patches about the angles of the mouth, upon the lips and face, generally do well under the local application of the solution of the bichloride of mercury. If this does not hurry them away, one or two light applications of the acid nitrate of mercury usually leaves nothing to be desired in the way of efficiency.

When mucous patches occur about the anus, under the foreskin, on the sides of the scrotum, or about the vulva, between the toes, under the breast in the female, in any region where overlying portions of the skin keep the surfaces of the lesions sodden, retain their secretion and encourage putridity of the moisture as it collects—in any of these contingencies, soap and warm water, followed by a mild dilution of Labarraque's solution, of permanganate of potash, or of carbolic acid, are great aids to treatment.

[1] Any other bland excipient may be used. Vaseline is perhaps the best if the ointment is to be kept for any length of time, since it does not become rancid. Ointments made with vaseline, however, are somewhat less active than if another fat is used as an excipient.

The lesions must also be kept dry, if possible, either by interposing layers of thin old linen, absorbent cotton, or prepared lint, between the surfaces which lie in contact, or by a plentiful use of some absorbent powder, such as lycopodium, starch, oxide of zinc. A very effective way of treating these lesions is to dust them plentifully and often with pure calomel, or with calomel in varying proportions combined with one of the inert dry powders mentioned above.

All that is required besides this, even in bad cases, is to touch the separate moist lesions with solutions of nitrate of silver of varying strength, gr. x.— ʒ j. to the ounce of water; or lightly with the solid stick of lunar caustic; or, perhaps better still, to use the solution of the bichloride of mercury already recommended for skin lesions.

Ulcerated lesions upon the integument, due to late syphilis, generally improve under various local mercurial applications. The black and yellow washes of the pharmacopœia serve a good purpose, as does also a mild solution of the bichloride of mercury, or dusting the surface with calomel.

Gummatous and serpiginous ulcers sometimes improve under these applications, but sometimes they do not. In such case it is well to try iodoform in fine powder, or rubbed up into a paste with gylcerine, or dissolved in chloroform, remembering that the chloroform solution is sometimes a painful application.

A watery solution of chloral hydrate does very well in some old, sluggish cases, from gr. v.—gr. xv. to the ounce of water.

Ulcers on the leg, if old and chronic, often improve at once upon the use of Martin's rubber bandage, or Fox's rubber tubing, or any other species of strapping, while some phagedenic forms of ulcer ought to be allowed the chance of benefit promised by the continuous submersion system described at p. 43. Chronic syphilitic ulcers with hard edges do well if their edges are scarified and poulticed at first. Ulcers communicating with necrosed or carious bone, or with sinuses leading into joints, cannot be expected to get well until the deeper-seated lesions have been overcome.

LOCAL MEASURES APPLICABLE TO SYPHILITIC LESIONS UPON THE MUCOUS MEMBRANES.

Great cleanliness is the first requisite in treating syphilitic lesions of mucous membranes. The mouth must be subjected to all the rules mentioned in connection with the hygiene of the mouth (p. 112), and the use of astringent mouth-washes, as well as some of the other measures suggested in cases of salivation (p. 126), might be called for. The use of tobacco must be stopped in the case of mouth lesions; the vagina and vulva should be syringed and washed frequently in the event of lesions in this quarter; constipation must be avoided, and cleanliness enjoined whenever the rectum is threatened with trouble, or becomes the actual seat of lesions.

Mouth lesions are the most common and most apt to be protracted. Steaming the throat and mouth, gargles of hot milk, of infusion of flaxseed, of warm tea, with or without a little borax, gr. x.—xx. to ℥ i., or chlorate of potash, gr. v.—xv. to ℥ i., have an excellent soothing effect in these cases. A certain amount of chlorate of potash should be swallowed,

that, by returning into the mouth in solution in the saliva, it may keep up a constant, mild, soothing action upon the various lesions.

One excellent expedient, in cases where mouth lesions are constantly recurring, is to give whatever mercury may be required for general treatment in the form of compressed pills of sugar-of-milk and bichloride of mercury. Such pills of varying strength are made by Dunton and by Wyeth. The two-milligramme pill is a good one for general use. These pills are allowed to dissolve slowly in the mouth, the saliva being swallowed. In this way the local effect of a solution of corrosive sublimate upon the mouth lesions is obtained at the same time with the carrying out of general treatment. The only objection to this expedient is that the taste of bichloride, while the pill is slowly dissolving in the mouth, is very coppery and offensive to some patients.

The best local applications to make upon syphilitic mouth lesions are solutions of corrosive chloride of mercury.

℞. Hydrarg. chlorid. corrosiv..... gr. ij.—v.
Spts. rect..... ℥ i.
M.

To be painted over the affected surfaces with a soft brush daily;

Or, the acid nitrate of mercury, pure, in small quantity, touched upon the lesion twice a week;

Or, applications of the nitrate of silver, or of the nitrate of zinc, solid or in solutions of varying strengths;

Or, the daily use of a solid lump of pure sulphate of copper, which is to be lightly rubbed over the lesion.

Mercurial fumigations (p. 124) are of the utmost value in many forms of mouth lesion.

In cases of pure gummata of the mouth and throat, it is best not to waste time with mercurial local applications, since attention in this way may be diverted from the main hope in such cases—the unsparing use of the iodide of potassium internally.

Upon the vulva, vagina, beneath the prepuce, and elsewhere, the same general line of treatment is to be followed as for similar lesions within the mouth—cleanliness being perhaps of more value than any other one local method of treatment. Pedunculated condylomata, or other vegetations, may be snipped off, and the base from which they grow cauterized.

THE IODIDES AND PREPARATIONS OF IODINE.

Several of the iodides with alkaline bases hold a high rank in the treatment of syphilis, especially of its later symptoms; and justly, for the prompt effect produced upon certain symptoms, especially where the lesion is gummatous, by a free use of the iodides, is often very striking. To be effective, however, the iodides must be used wisely; and it is well known what they can do and when they may be trusted.

Unfortunately, the popular dislike to mercury is shared by many physicians; and these gentlemen, in looking around for a specific for syphilis which is not mercury, often fall upon the iodides and administer them in different vegetable infusions and tinctures from the very beginning of syphilis, praising themselves and calling for the applause of their patients in that they give no mercury. It is better, doubtless, to

treat early syphilis with iodide of potassium, than not to treat it at all; but exactly how much better, it is hard to estimate. The iodides have little power in postponing erruptions, or promptly modifying them after they have appeared early in syphilis. They certainly have little or no power in preventing relapse either early or late in the disease. I think that I brought out this point satisfactorily in the paper I have already alluded to, read before the International Congress at Philadelphia, and need not reproduce here the line of argument there followed. The iodides have their place, and a very important place it is; but I think it unfortunate that they are accredited with much curative power over syphilis, since this notion naturally leads to their abuse, and tends to bring them into disrepute.

Whenever the lesion is gummatous, in most of the intermediary and late syphilides, and whenever the proliferative changes of connective tissue so common in advanced syphilis in the internal organs are going on, the iodide of potassium is a power, and an enormous power, which may be used to the great advantage of the patient, either alone in very large doses in appropriately selected cases, or in combination with mercury, in more moderate doses,—constituting what is known as the mixed treatment.

When, however, the symptoms for which the iodide is used have been fairly and entirely overcome, then the mercurials resume sway, and it is better shortly to drop the iodides, holding them in reserve for other emergencies.

The preparations of iodine most valuable in syphilis are the iodides of potassium and of sodium. The iodides of calcium, starch, and ammonium are also used, and iodine as tincture, simple and compound, and in the shape of iodoform internally. I shall speak of these last first, in order to dispose of them.

I have been disappointed in obtaining any marked effects from iodoform internally given in doses of a fraction of a grain up to three grains at a time. I have given a single dose of half a drachm, but without obvious effect, in a case at the Charity Hospital. I cannot, therefore, from personal experience recommend it, or give any special indications for its use. It is spoken well of, however, in some high quarters, used in rather small doses in combating gummatous disease—as of the tongue (Hill).

The tincture of iodine, and the compound tincture in starch-water (forming the fresh iodide of starch), I have used at times with undoubted advantage. It is very dark to look at, and not pleasant to the taste, being flat, rather nauseating than otherwise; but it is, on the whole, bland and rather easily digested, and I certainly have seen decided advantage follow its use in cases where the iodides of potassium or sodium were badly borne by the stomach. I have usually commenced with the tinctures in doses of ten drops in a tablespoonful or more of starch-water, and increased up to eighty drops in a claret-glass of the diluting fluid. I am not, however, at all willing to trust to the iodide of starch in an emergency.

The iodide of ammonium is generally used in combination with other iodides, under the idea advanced by Paget and sustained by Hutchinson, that the carbonate of ammonia given in combination with the iodide of potassium intensified the action of the latter. I have not used the iodide of ammonium alone in large doses.

The iodides of potassium and of sodium hold the first rank among the preparations of iodine as specifics against syphilitic gummata. Of these the first-named is the more powerful, but it has the disadvantage of be-

ing decidedly more irritating to the stomach than the iodide of sodium. Both of these iodides act alike, and both are of great value in the treatment of syphilis.

These iodides, however, like most other good things in the world, have their own peculiar bad qualities. Perhaps not the least of these is the fact that the drugs are expensive; while, unfortunately, it is necessary to use them in large, often heroic, doses. As a consequence, the iodides are generally much adulterated, especially in the smaller shops; and the poor man, who perhaps needs the drug more than his more wealthy fellow-sufferer, often gets in his dose as much bromide as he does iodide of potassium.

The bitter, coppery taste which the iodides produce in the mouth of the patient taking the drug in any considerable quantity, and most offensively tasted in the morning upon first awaking, is a drawback in some cases to the free use of the remedy. Occasionally the mouth is made sore by long-continued use of the iodides, the gums get tender and spongy, they swell as in true salivation, and a certain amount of soreness in the teeth is complained of, together with an increased flow of saliva—the whole, indeed, forming a sort of spurious salivation. These two lesser evils may be measurably abated: the first, by the use of peppermint in some form, both at the time of taking the dose and upon awaking in the morning; the second, by the use of astringent mouth-washes, diuretics, and such remedies as are generally useful in true salivation.

Besides these lesser evils sometimes attending the use of the iodides, there are five other serious discomforts which are attached to their employment: acute catarrh, headache, iodism, cutaneous eruptions, and irritation of the stomach.

Acute catarrh, to the extent occasionally of rendering the patient very miserable, sometimes comes on at the very beginning of the use of the iodides. The patient sneezes and coughs, the eyes grow red and watery, the nose runs, and with this sometimes comes an intense pain across the brow, and perhaps severe headache. This symptom, like most of the others due to the iodides, varies in intensity with the strength of the dose. Unlike some of the other symptoms, it often wears off as the iodide is continued in use, or at least the patient gets accustomed to it and complains less.

The treatment of this catarrh is to keep the skin active by the use of warm baths, to give the patient plenty of bland fluids to drink, and to encourage the action of the kidneys, the proper channels of exit for the iodides. Belladonna internally, in small quantities, has a certain amount of influence in controlling the amount of secretion from the nose and throat.

The headache produced in some people by the use of the iodides is quite intense. It usually occupies the brow, or the side or the whole top of the head. The headache comes on sometimes after a single dose of the offending drug, and sometimes is so intense that it constitutes a positive bar to the continued use of the remedy. Fortunately, cases of this sort are quite rare.

The only treatment, so far as I know, able to remedy this condition, is to give a mild diuretic in combination with the iodide, and to add some of the bromide of potassium to the mixture, or even a little opium. Fortunately, this idiosyncrasy of having headache when taking the iodides is not always an affair of a lifetime; the patient generally outgrows it in time.

Iodism, properly speaking, includes the headache and catarrh already alluded to; but the main feature in iodism proper is a peculiar and intense nervous depression, with irritability. This occurs in certain individuals when they take the iodides. With this depression there may be more or less ringing in the ears, pain in the bones, etc.

Iodism is difficult to overcome by treatment; usually all efforts fail. The general means mentioned above for the headache of iodine may also be tried here.

The cutaneous eruptions produced by the iodides are numerous. Erythema, with considerable scaling of the skin, and acne, with boils about the face, nose, neck, back, shoulders, and buttocks, are not uncommon results of their use. Purpura hæmorrhagica is produced by the iodides, especially in debilitated, anæmic persons who have taken the drug for a long time. A peculiar form of pemphigoid eruption occurring in groups, and sometimes called hydroa (Hutchinson), is another of the evil results of the iodides upon the skin of some patients.

The irritation produced in the stomach, and sometimes in the intestine by the iodides, especially when used in large doses, is another seriously bad quality which they possess. In this way nausea and lack of appetite may be induced, going on, sometimes, to diarrhœa, and leading to anæmia and loss of strength—misfortunes which, by so much, go to counteract the good effects produced by the drugs.

This irritation of the stomach and skin attaches often to an imperfect elimination of the drug by the kidneys. When a patient is under full doses of the iodides, his urine is full of them, as may be demonstrated by pouring a little nitric acid into a test-tube containing some of the urine. The stronger acid attacks the salt and liberates the iodine, which colors the urine, lying above the layer of acid. If the kidneys do not do their duty properly, some of the cutaneous expansions of the body must suffer: it may be the membrane of the nose; it may be the skin of the face or back, or the glands this skin contains; or it may be the stomach. The stomach is also particularly exposed to irritation by direct contact with the medicine. This direct contact the stomach always resents, especially if the drug be presented to it in a concentrated form, when it is empty.

The natural deduction from all this is that the kidneys must be kept always active, when the iodides are being administered, by the use of plenty of water and bland fluids on the part of the patient, as well as by diluting the drug largely when it is taken, and giving it always upon a full stomach. If these means do not suffice, the dose of the iodide may be combined with a more active diuretic—such as the acetate of potash, or the infusion of digitalis, or both.

Sometimes, in spite of all precautions, the iodides cannot be taken by the stomach. Under such circumstances I have sometimes succeeded in using the rectum, giving ten and fifteen grain doses of the iodide of sodium dissolved in an ounce of warm beef-tea. I have tried iodoform in suppository—gr. vi. at a dose—but have failed to get any good systemic effect from the latter drug. When the stomach fails, the iodide of starch may often be borne, and should have a trial.

Above all, it must be borne in mind that the iodides should never be given solid (in pill form) when their use in large quantities is required. Small doses in pill form do very well in some cases, as high as gr. v. of the iodide in each pill; but such pills should only be given upon a full stomach, or, perhaps better, taken during the middle of a meal.

When it becomes absolutely necessary to push the iodides, it should

be done in spite of all obstacles to the contrary. I succeeded, in one such case, in arresting a destructive gummatous ulcer by confining my patient exclusively to boiled milk and rice as food, and giving bismuth in considerable quantities, while the iodide was being pushed. The addition of opium, or anything else to make the drug act, is allowable under these circumstances.

The dose of the iodides is about five grains, to commence with in an ordinary, untried case, where the effect of the drug has never been tested, and when there is no emergency to deal with. This five-grain dose will generally indicate in what way, if at all, the patient is to be uncomfortably affected by the iodides. An occasional pimple of acne on the forehead or temple is generally all that will be seen, with perhaps a little excess of secretion from the mucous membrane of the nose during the first few days of the course. For an ordinary case, where there is no haste and the stomach is to be respected, the dose of the iodide may be pushed by an increase of two and a half grains in the dose each week. By such a gradual increase, with a little care, the stomach need not be injured, the skin is not apt to give much trouble, and the weekly increase in the dose may be suspended when the symptoms have fairly yielded.

No such caution, however, can be indulged in when an emergency is at hand. When the soft palate is threatened with rapid destruction by a perforating gummy ulcer, when the bones of the nose are crackling under the touch, when the functions of the brain are involved or life threatened, then there is no time for hesitation or delay, and it is not necessary to ask whether the iodide will agree or not. If it does not agree, it must be made to agree—a process which may tax the resources, the ingenuity, and the patience of the surgeon to the utmost. Under such circumstances, a dose of ten grains every four hours is a moderate beginning, and in one or two days, according to the surgeon's judgment and the patient's necessities, the dose may be increased by five or ten grains, and so on, indefinitely, until the symptoms yield or the stomach refuses to receive the drug.

In such a case the stomach must be managed with all care in the manner suggested above, and opium, if need be, bromides, or diuretics, with bland food, judiciously joined to the iodides in such a way that the stomach shall have no excuse for rebellion. Limit to the dose there is none: the signal to stop increasing the dose in a desperate case is unconditional surrender on the part of the symptoms. If the diagnosis has been accurate and the stomach can be managed, this result will follow as surely as the night follows day. The physician need have no fear, there need be no hesitation. If the stomach holds out, and the drug is boldly and intelligently pushed, victory is the one and only result. All minor symptoms of iodism may be disregarded, the eruptive troubles, the catarrh, even the headache and depression of spirits, although these last make some patients desperate, so that they seem rather willing to suffer anything from the disease than to be compelled to continue their medicine.

The limit to the dose which may be given I do not know. It is certain that more than an ounce of the solid salt has been taken daily by a single patient, and continued a number of days with advantage, and this has been done a number of times in various cases by different physicians. It is rarely necessary, however, even in the most desperate cases, to go higher than three or four drachms a day; and such a quantity is better in its results if administered in six than in three doses, always well diluted with water.

When small quantities are to be given for a considerable time, and the stomach has been first tested with a solution to try its temper, the medicine may be given in pill form for the sake of convenience. It is not easy to make good pills out of the iodide of potassium, on account of the tendency they have to become moist by contact with the atmosphere, to stick together and disintegrate. Pills of varied strength up to five grains of the pure iodide of potassium are now found in the shops in the compressed form. They bear transportation well if kept in bottles stoppered with a cork. To make up a pill, however, of any strength, a little pepper, gum tragacanth, and glycerine make excellent excipients. Such a pill when well made grows solid, smooth, and quite hard; but its hardness is no obstacle to its digestion, since the affinity of the iodides for water is very great, and such pills readily break up in the stomach. A fair formula is the following:

℞. Potassiii odidi..... ʒ ij.
Pulv. pip. nig..... ℈ i.
Gum tragacanth }
Glycerinæ } ..... q. s.
M. Ft. pil. no. xxiv.

These pills are not unnaturally large, each one contains five grains of the iodide, and they should be taken with or immediately after each meal. In many cases they do not disagree, in others they certainly do.

A favorite method of giving the iodides is in combination with some bitter vegetable tincture or infusion, which serves the double purpose of masking the peculiarly pungent, bitter taste of the drug, as well as in a measure assisting its digestion. The taste of the iodide may be still further covered up by the addition of ginger, peppermint, or bitter orange, to the solutions in one form or another, and the dose thus made actually agreeable. Some ammonia may be added, if thought best, out of respect to the general conviction that the presence of this drug enhances the therapeutical activity of the iodide. Such a formula as the following is rarely objected to:

℞. Potass. iodid..... ʒ ij.
Ammoniæ subcarb..... ʒ ss.
Tr. cinchonæ co..... ʒ iv.
Glycerinæ..... ℥ i.
Syr. aurantii cort..... ℥ iss.
M.
S. Teaspoonful largely diluted with water after each meal.

For convenience of administration, where the dose of iodide is to be constantly and rapidly pushed, it is well for the patient to have two prescriptions: one something like the one given above, and another a saturated solution of the iodide of potassium in distilled water:

℞. Potass. iodidi..... ℥ i.
Aquæ destillatæ.....q. s. ad fl. ℥ i.
M.

Of this solution one minim measured in a minim-glass represents a grain of the iodide of potassium, and it may be very conveniently used,

a teaspoonful of the pleasantly tasting mixture being mingled with water, and as many minims extra of the saturated solution of the iodide being added to each dose as may be required to make the dose of the iodide sufficient, in cases where this is varied a little from day to day.

It will be noticed in the foregoing prescription that only enough water is ordered to make an ounce of fluid in all. As commonly written, the prescription reads:

℞. Potassii iodidi..... ℥i.
Aquæ destillatæ..... ℥i.
M.

Such a formula makes more than an ounce of fluid—nearly an ounce and a half, in fact—and it takes about seven minims to equal five grains of the iodide of potassium.

All the remarks thus far made have referred to the iodide of potassium, nothing having been said of the iodide of sodium. The potassium compound is the stronger, being just about twice as effective as the sodium combination. It is therefore to be preferred, and in all cases should be commenced with first. When, after fair trial and reasonable effort, it has become apparent that the potassium iodide is not suitable, and that the stomach will not bear it, then the sodium iodide may be substituted, often with very good effect, since in this, as in many other cases, the soda salt is more comforting to the stomach than the potash salt. All that has been written, therefore, concerning the iodide of potassium is equally applicable to the iodide of sodium for those cases in which the stronger drug is not well borne.

MIXED TREATMENT.

The mixed treatment is a combination of one of the iodides with a mercurial. It is one of the commonest forms of treatment, and one of the most useful, when intelligently directed. It is of no value at the beginning of the disease. The over-zealous young practitioner, in his early efforts to do all he can for his patient, is quite apt to overshoot the mark in trying to obtain for his patient all the good possible out of all kinds of medicine. He frequently gives the mixed treatment (mercury and potash, as he commonly calls it, instead of mercury and iodine, which it more properly is), ordering it as soon as he decides that a given chancre is syphilitic.

There is no advantage in such a course. Mercury is all-sufficient in the beginning, and anything like polypharmacy is of doubtful wisdom, since the stomach and its integrity constitute the sheet-anchor of the syphilitic patient in the long run. He may have much medication to endure, and it is well to spare him in the beginning. Many stomachs submit to the prolonged use of the iodides without a murmur, for years; but there are others which gradually fail in digestive capacity, and reduce the patient to a condition of anæmia, with great general nervous irritability and prostration, and that, too, without giving rise to any marked active evidences of dyspepsia. The iodides, long continued, are fully as apt, or more apt, I think, to do harm than the mercurials. It may become necessary, during a prolonged and obstinate attack of syphilis, to

use not only the mercurials for a long time, but the iodides also; and when it becomes necessary, let it be done. But this is not an excuse for using the iodides out of place, or calling upon the stomach for extra work where it is not required.

The mixed treatment is appropriate in all the slower, more chronic symptoms of the intermediary and late stages of syphilis. The basis of the treatment is an appropriate iodide, either of sodium or of potassium, as the case may be, and with it a mercurial. The treatment may be effectually carried out by giving a suitable dose of the iodide, as directed in the last section, and adding the mercury by fumigation, inunction, or separately in pill. It is a little more appropriate, however, and perhaps more accurate in dosage when giving the mixed treatment, to mix the drugs themselves in the same pill or potion. The best drug to mix with the iodides is the biniodide of mercury. Most other forms decompose, and the resulting compound is an uncertain amount of biniodide of mercury with an equally uncertain quantity of the other mercurial, however much there may be which has escaped decomposition.

The biniodide of mercury, therefore, may be added to any of the pills or fluids already referred to in the section on the iodides, in a dose varying from one-thirtieth up to a tenth of a grain. The new ingredient in the combination will make no difference in its form or taste, but often makes a great difference in its effect upon the patient.

Some of the compressed pills found in the market are made so as to represent the mixed treatment, containing varied proportions of the iodide of potassium and the biniodide of mercury.

In using the mixed treatment, it is often desirable to continue the mercury at a given rate while the iodide is steadily pushed. This constitutes what is called mixed treatment with iodides in excess, an expression which will be found to occur several times in this book when speaking of the treatment appropriate to some of the various lesions. Such a treatment may be conveniently carried out by adopting a certain fixed formula for the mixed treatment, preferably one which shall not be distasteful to the patient, and furnishing him besides this with a minim-glass, and a saturated solution of the iodide of sodium, or potassium, as the case may be. In this way the dose may be easily regulated to suit any emergency.

I find the following to be an excellent standard to use as a base of operations:

R.	Hydrarg. biniodidi	gr. ss.—i.
	Potassii iodidi	ʒ ij.
	Ammonii iodidi	ʒ ss.
	Syr. aurantii corticis	℥ ij.
	Tr. aurantii corticis	ʒ j.
	Aquæ destillatæ	q. s. ad ℥ iv.
M.		

S. Teaspoonful well diluted in water after each meal.

When to cease giving the iodides is a question of importance. They are useful, most useful, against certain symptoms in syphilis, but they cannot claim power to prevent relapse. Therefore we should use them, and vigorously too, against those symptoms which they control, but should not depend upon them for any more work after the symptoms

have yielded. The main difficulty in the case is, therefore, how to tell when the symptoms in question are thoroughly controlled. A gummatous infiltrated patch may gradually melt away under the bold use of the iodides, and seem to be entirely gone; yet, if the iodides be discontinued too soon, this patch will relapse in many cases. How can it be, then, that the iodides do not prevent relapse?

I think that the answer to this question may be found by analogy in the study of other infiltrations. Gummatous processes are infiltrations, and the tertiary connective-tissue proliferations, the parenchymatous hypertrophy of organs, is an analogous change. These diseased conditions of the tissues extend farther than is evident to the naked eye. In the same way cancerous infiltrations and epitheliomatous nodules far outreach their limits as apparent to ordinary inspection. An epithelioma may be burned upon the surface, and the nodule apparently destroyed—so much, indeed, that a thin, unhealthy scar may form over the spot; yet the morbid tissue, although apparently all gone, often remains in the outlying tissues, and in such a case local relapse is inevitable. The same is true of lupus, and the effect of local applications upon it; and of carcinoma, and the cutting operations to which it is subjected.

In the same way with syphilitic infiltrations: the remedy which removes them, the iodic preparations, must be long and patiently continued after the local trouble is apparently under control, or local relapse is certain. It is customary, therefore, to continue the mixed treatment for months after all evident need for the iodides has passed, and then gradually to drop the iodides and resume the mercurial at the tonic dose. Eventually the mercury itself may be gradually dropped after a number of months, differing in varying cases, according to the judgment of the physician.

In some cases of old syphilis, especially the nervous forms, where the iodides have been long given in large doses, the symptoms may, after a time, fail to yield to the drug, while the patient gradually grows thin, nervous in the ordinary sense of the term, tremulous perhaps in his movements, unable to sleep, to digest food, to perform mental work. I have treated one such case, where the patient finally became unable even to sign his name so that the writing would not be questioned, while yet some of the symptoms of nervous syphilis were still upon him.

In such a case, specific treatment, so called, loses its value. The patient I allude to above got perfectly well by dropping his specifics entirely, taking the hypophosphites, giving up work, and going to the country for several months. He became well, and has remained so for the past two years, although just before leaving off his treatment he had had gummatous deposit within the orbit, with paralysis of the internal rectus. Another patient, totally incapacitated for work by a prolonged treatment with the iodides, on account of serious syphilitic cerebral symptoms, recovered entirely upon leaving off all medication, and going to the dry cure in Lindeweisse, in Austrian Silesia, for six weeks.

Such patients sometimes get well under the homœopathic cure (*i. e.*, without medicine), or by syphilization, or by going to one mineral spring or another, or (quite often) in water-cure establishments. These patients are very appropriate for a course at the hot springs.

The main difficulty in the case of patients of this sort is to determine just at what time they may safely give up the use of the iodides. They are a source of great solicitude to the physician in charge, and his best judgment is seriously taxed in their management.

For these cases, tonics, change of residence, freedom from annoyance

and from mental work or worry, are essential; and a course at some of the hot mineral springs, or at a water-cure establishment, is often of the greatest value.

ZITTMAN'S DECOCTION.

In terminating the general remarks upon the routine treatment of syphilis, something must be said about Zittman's decoction. This remedy has long held a respectable place in the minds of the profession, and the formula by which it is prepared, in a stronger and a weaker decoction, retains its place in the dispensatories. It is a remedy of undoubted value in many conditions of late syphilis attended by cachexia, loss of appetite, anæmia, and irritable stomach, especially when the iodides disagree. Its action is probably largely dependent upon the laxative influence of the senna which it contains, and upon the general combination which makes the mercury in it acceptable to the stomach.

There have always existed two great drawbacks to its general use: (1) it is difficult to prepare, containing a host of ingredients which must be so concocted that much time is consumed in their proper preparation; and (2) its use according to the rules formerly laid down is too irksome to be endured by most patients, while the quantities necessary to produce any effect (a pint and more a day) cannot be conveniently mastered by many patients with delicate stomachs. Then, also, the rules about preparatory purgation, rest in bed, hot water with one decoction at one time in the day, and cold water with another decoction at another time of day, smack really more of the wizzard than of the sage, and tend to bring the remedy into disrepute with honest-minded persons, lay as well as professional.

The truth is probably that judicious purgation, with a light tonic purge containing a mercurial, and that too in fair dose, is what does the good. In McDonnell's lectures on surgery in 1871,[1] I noticed a modified Zittman's decoction which did away with much of the apparent nonsense of the older preparation. This I used for a time, but, finding even this too clumsy, with its larger and smaller dose, and cold and hot water, I have reduced it to a single combination, from which in many cases I have derived great advantage. I generally order a teaspoonful as a dose, to be taken as it is without water, three or four times daily, regulating the quantity by the purgative effect. The following is the formula I employ:

℞.	Hydrarg. chlorid. corrosiv.	gr. i.
	Aluminis	ʒ ss.
	Extr. sarsæ	fl. ℥ ij.
	Glycerinæ	℥ i.
	Syr. sennæ	ʒ iss.
	Spts. anis.	ʒ i.
	Extr. glycyrrhizæ	ʒ i.
	Aquæ fœniculi	q. s. ad ℥ viij.
M.		

S. Tablespoonful at a dose.

In my hands it has answered as well as the original formula.

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[1] Page 114.

Lockwood, in the London Lancet, 1879, gives two cases illustrating the good effect upon obstinate syphilis, of injecting one-sixth of a grain of nitrate of pilocarpin under the skin every other day, in combination (in the worst case) with a continuance of mercurial treatment, which until then had not been effective. Piffard, of New York, has suggested the same idea.

The treatment of inherited syphilis, and of syphilitic women during pregnancy, will be given under their own sections.

CHAPTER VIII.

SYPHILIS OF THE SKIN.

Special Characters of the Syphilides: Polymorphism, Color, Form, Absence of Subjective Symptoms.—Characters of Scabs, Ulcers, Cicatrices in Syphilis.—The Syphilides: Erythematous, Papular, Pustular, Ecthymatous, Pigmentary, Vesicular, Squamous (Circinate, Palmar and Plantar), Tubercular (General, in Groups).—Tertiary Syphilides.—Rupia.—Tertiary Pustular Syphilide.—Ecthyma.—Pustular Syphilide in Groups.—Tertiary Syphilitic Ulceration.—Gumma of the Skin.

SYPHILIS appeals to the public and to the patient most strongly through its effects upon the skin. The temporary or possible permanent disfigurement caused by it upon the outside envelope is what lends it most of its horror in the mind of the ordinary patient. The more serious affections occurring later have no terrors for those who ignore their existence; and generally the patient, once free from his symptoms of the skin and mucous membranes, considers himself well, and, often to his cost, stops his medical treatment under the idea that his malady has ceased to exist.

The symptoms upon the skin and mucous membranes have also given the physician his best field for studying syphilis; and since the dermatologist has brought his powers to bear upon a study of the numerous lesions of the skin produced by syphilis, much peculiarity has been found to exist in all the lesions due to the disease, and much distinctiveness in form, color, grouping, etc., so that the class of eruptions produced upon the skin by syphilis, and known as syphilides (Biett), has come to be quite well known. The syphilides are generally capable of being diagnosticated by the aid of simple inspection. A good clinical student of syphilis can usually do this without asking a single question or touching the patient; and although it is not wise to jump at a diagnosis, yet the fact that it is possible to do this makes it at once evident that all the eruptions due to syphilis must be possessed of some very marked characters, capable of easy detection and distinguishing them from other eruptions. This is the case, and before going into the detail of description of the different eruptions it will be well to consider the general characters which are shared by them in common.

Certain effects are produced upon the skin by syphilis which are not at all peculiar to the disease, but may be just as well produced by other causes, and these effects naturally do not share in the general peculiarities belonging to lesions due exclusively to the effect of the syphilitic virus. The changes in the skin referred to are the sallowness, the branny condition, the lack of lustre in early syphilis, the flabbiness in cachexia, the general tawny hue often seen in the same stage, the seborrhœa, the dryness—none of these features found upon a syphilitic patient differ materially from the same conditions when encountered upon a patient *rendered ill by* the action of some other debilitating cause. They, there-

fore, are not peculiar, are not to be diagnosticated by inspection—indeed, are not syphilitic, except in that they have become so by accident.

The peculiar characters of syphilitic lesions of the integument—those which they possess collectively as a group of affections—may be best studied by examining them in detail. They are polymorphism, color, form, and the absence of subjective symptoms in connection with them; the grouping of the lesions, the characters of the scabs and ulcers, and the appearance and behavior of the cicatrices.

Polymorphism is quite a distinctive feature in the early syphilitic exanthemata. Generally, it is supposed that a cutaneous eruption will be uniform in the type of its lesion. It is expected to be purely erythematous, going on to the formation of scales (roseola autumnalis), or pustular preceding scabs (impetigo), or vesicular terminating in an oozing surface (eczema); but this does not hold for a syphilitic exanthem. The evolution of the syphilitic eruption is in successive crops of lesions, and some of these go on to a fuller development than others; therefore, in one and the same syphilitic eruption, at almost any period in its course, it is often possible to find the most varied lesions associated side by side: the macule, the papule, the vesicle, the pustule, the scale, and the pigment spot.

Polymorphism does occur in other cutaneous diseases, but it is so constant in the syphilitic exanthemata as to be worthy of special remark. The same morbid spot upon the skin, in going through its evolution, assumes the form of several lesions; but, in the general eruption, there is always an excess of one lesion or another, and this type lesion names the eruption, causing it to be called after its name—(papular, pustular, vesicular, etc., syphilide).

Color.—The color of syphilitic eruptions is peculiar. The earlier and more acute eruptions are pink and red, a color much like that seen in ordinary inflammatory states. As the freshness dies out of these eruptions, however, they assume the syphilitic tint, and, in some instances, they possess it from the start. This tint is simply a certain lividity mingled with red. It has been called by many names, but that which suits it best is the raw ham color. Swediaur's term, copper color, has taken a greater hold upon the profession, but is less accurate in expressing the tint of syphilitic lesions in their period of activity. The copper color is found to perfection in many of the lesions after they become pigmented, and it often remains for a long time in scars left by lesions, and in the areolar border of the latter.

The color is not due to the syphilitic poison, but to the subacute, or indeed, chronic quality of the inflammatory process which produces and attends the lesions. The superficial vessels become dilated, and continue so over circumscribed areas for a considerable period. A certain number of red blood-cells wander out into the tissues through the walls of these vessels, and these cells, while passing through the changes which precede their absorption, give up their coloring matter, which becomes modified, and the pigment deposits and shows through.

This congestion and small amount of pigment makes the raw ham color. It is rarely absent in any of the syphilides. As the congestion goes down and the vessels return to their natural size, the pigment becomes more obvious, and then the copper color appears. Finally, nothing is left but pigment in greater or less quantity, and the color may be that of bronze.

These shades of color are found exactly copied in some forms of psoriasis, in certain chronic eruptions on the skins of gouty people, in eruptions

on the legs of many persons neither gouty nor syphilitic, in many cachectic conditions, and upon certain dark skins with almost any eruption. On the other hand, fair skins sometimes show little of the ham color in their syphilitic eruptions, and none of the copper color or subsequent pigmentation of scars.

Hence, it becomes evident that there is nothing specific either in color or in pigment; yet, the peculiarities of color and of pigment are so uniform, and so well marked in most cases, that they constitute a feature which should be always looked for in eruptions of suspected syphilitic origin, and to which considerable importance may justly be attached. The pigmentation remaining behind after syphilitic lesions is not permanent. It clears away promptly in light cases, more slowly in others. It remains longest on the lower extremities. It clears up from the centre peripherally, leaving any cicatricial tissue which it may have involved more white than the surrounding skin. Occasionally, especially around a cicatrix in the lower extremity, it remains permanently.

Form of the lesions and their distribution.—The earlier eruptions are generalized more or less over the whole body, each separate lesion showing a tendency to assume the rounded form. Later, the lesions tend to cluster into circles, and segments of circles, and to be symmetrical in their distribution. The latest lesions show little or no tendency to symmetry, but preserve in a marked degree the rounded form. Gummatous ulcers are often composed of the confluence of several gummata, and the borders of the ulcer consequently are made up of segments of large circles.

Absence of subjective symptoms is a marked feature of syphilitic eruptions. In nearly every case, and in nearly every class of eruption, from the macule to the most extensive ulcer, there is customarily an entire absence of any itching or pain. This rule, like all others in syphilis, has its exceptions. An acute outbreak of an early syphilide commonly occasions a little tingling, but rarely any itching. Ulcers, if connected with bone, or upon the lower extremities, often pain considerably, sometimes excessively. On the other hand, the scrofulides, and many gouty eruptions, with most of the forms of lupus, are equally devoid of subjective symptoms, so that these peculiarities of syphilitic eruptions cannot be considered to be pathognomonic. Nevertheless, the conspicuous absence of itching and pain is a feature of great diagnostic value in connection with the syphilides.

The possibility of the coexistence of an irritable skin and some pruritic condition, not syphilitic, in connection with a syphilide, must be remembered, together with the fact that more or less itching is quite apt to accompany any eruption upon the scalp, of whatever nature. Even ordinary acne of the scalp itches sometimes.

The scabs and ulcers of syphilitic lesions have some peculiarities. The scabs are apt to be thick, rough upon the surface, set into the skin at their edges, and adherent, unless undermined with pus, as in rupia. There is generally also a marked greenish tint in the scabs, whether the latter are dark or light colored. This green tint is often due to the admixture of a certain amount of blood with the pus forming the scab. The ulcers of syphilis resemble chancroidal ulcers. Their borders are sometimes undermined, but generally adherent. The floor is pale, uneven, more or less pultaceous, the discharge purulent. The edges are abrupt, perpendicular. The base may be either hard or soft.

The cicatrices of syphilitic lesions are quite uniform in their charac-

ters. They are round, depressed, smooth, thin, and not adherent, unless lying over bone. They are dark at first, from the pigment they contain; and as this clears off centrally, the scar grows white and shining, its whiteness intensified, and set off by the dark frame of pigment which lingers as an areola about the circumference of the cicatrix. The cicatrices of ulcers upon scrofulous patients, and of rupial ulcers on all patients, are apt to be puckered, drawn, bridled, thickened in parts, and adherent, like the scars of scrofulides.

THE SYPHILIDES.

The eruptions found upon the skin in secondary and intermediary (late secondary) syphilis are seven. The last three occupy the borderline, and may, any of them, be found long after the patient has suffered from well-marked tertiary gummatous lesions of bone, or of the other tissues. These three occur also just as well entirely within the secondary period, and are best classed along with secondary lesions, since they require mercury in their treatment generally much more than they do iodine. These seven eruptions are named according to the prominent lesion which characterizes them. They are:

1. The erythematous syphilide (roseola).
2. The papular syphilide.
3. The pustular syphilide.
4. The pigmentary syphilide.
5. The vesicular syphilide.
6. The squamous syphilide.
7. The tubercular syphilide.

The lesions belonging to the tertiary period, all of which are prone to run on to ulceration, to destroy tissue, and leave scars, are three in number:

1. The pustulo-bulbous syphilide (rupia).
2. Pustular syphilide: { *a*, with infiltrated base (ecthyma). *b*, in groups.
3. Gumma: { *a*, as infiltration: { 1, non-ulcerative. 2, ulcerative. *b*, tumor.

In connection with all of these occur lesions on the mucous membranes, which will be considered in their proper place, and varied general symptoms: glandular engorgement, fever, alopecia, etc., some of which have already been considered. No one patient can well have all the syphilides, but he may have a number of them successively.

THE ERYTHEMATOUS SYPHILIDE.

This is the most common and the earliest of the general syphilides. It may come on within the month after the appearance of chancre; generally it dates at six weeks or two months, sometimes later, especially if delayed by treatment. It first appears upon the lower part of the thorax in front, and at the sides, over the belly, and in the flanks. To see it at the

commencement, it is sometimes necessary to let the light fall sideways upon the skin, freshly exposed to the cool air by lifting the shirt. A roseola detected in this manner, of course, could not be pronounced upon as being certainly syphilitic; but, by examining a patient in this way, often the very commencement of the eruption may be detected some time before it otherwise would have been found out. A very hot bath will frequently develop it several days before its natural date of outbreak. A sulphur-bath is particularly effective to this end. Patients do not feel the eruption, since it does not itch, and generally are unconscious of its existence until the physician points it out to them, unless they have been closely on the lookout for it, in which case they generally mistake the natural marbling of the skin, due to exposure to cool air, for roseola, and get frightened before their time.

The eruption comes out as a series of rounded macules, varying in diameter from one-eighth to half an inch, at first red, then tawny, then pigmented. At first the patches are flat, then they often become covered with minute papular elevations, and sometimes some of these papules go on to vesiculation, occasionally even to mild pustulation (although this is exceptional). The patch, therefore, is flat or raised, as the case may be. At first, pressure of the finger causes the mottling entirely to disappear; later, a slight, livid staining remains behind after the removal of pressure; finally, when the spot is fading, and has become slightly coppery from pigment, pressure has no more effect upon it.

The spots are never confluent—healthy skin always exists between the macules; but upon this skin there may be found a few other lesions sometimes, such as a papule or a pustule.

The hands and face, where the skin is tougher, often escape the eruption entirely.

The lesion is due (Biesiadecki) to capillary dilatation, escape of blood-cells and their accumulation along the vessels, and a growth of nuclei in the walls of the latter.

The duration of roseola is from a few days to six or eight weeks. It may relapse. An annular variety of large patches in groups, tending to run into the scaly form, is found occasionally at the end of the first year of syphilis. It runs a slower course than the roseola, occurring soon after chancre. If treatment (mercurial) has been commenced before the appearance of the eruption, its outbreak is postponed, and it may consist merely of a few scattered macules upon the trunk, requiring some diligence to find them.

The diagnosis of roseola due to syphilis is easy. The erythematous eruptions due to arsenic, bromine, mercury, belladonna, quinine, have different situations and groupings, and are attended either by internal fever or local itching. Copaibal erythema itches badly. Roseola autumnalis is attended by fever, and measles by its pathognomonic prodromata. The glandular, epitrochlear, and post-cervical engorgement, the existence of chancre and the throat symptoms (erythema and mucous patches), together with the scabs in the hair, the night pains, and the syphilitic fever, if present, make syphilitic roseola one of the easiest to diagnosticate of all the lesions due to syphilis.

Treatment is the general treatment of secondary syphilis by mercury, p. 117.

THE PAPULAR SYPHILIDE.

This eruption may be combined with a roseola, or follow the latter; or it may appear as the first syphilitic affection upon the skin after chancre. Its date of appearance is therefore about the same as that of roseola. The papules vary in size, from a minute acuminated papule, such as is seen upon the macules of roseola, to a broad, flat papule as large as a dime. A common form is the flat, lenticular papule, of about the size of a large split-pea. These papules are scattered about, not grouped, occupy the flanks, the trunk, the extremities, and very often the face. Fig. 2, from plate 101 of Fox's photographic series, shows the generalized distribution of the eruption.

FIG. 2.

The characteristic flat papule, which is the most common form, commences small, and grows in all directions except in height. It is hard and smooth upon its surface at first, later it is sometimes slightly depressed centrally. It is pink or red at the commencement, but very soon takes on the syphilitic livid tint. It sheds its epithelium on top, or the latter dries down quite early and cracks around the circumference of the papule. The broken, rough edge of the thickened epidermis then curls away, like a dirty lace collar, from the base of the flattened papule, giving the lesion a very characteristic appearance. The papules gradually sink away, leaving pigmented spots, but no scars. They come out successively, and may be found in different stages of development upon different parts of the skin.

On the palm of the hand the papules seem to abort, on account of the thickness of the scarfskin. A thickening of the scarfskin seems to take place, of the size of a papule. Then the epithelium gets yellow and dry, cracks, and drops out, leaving a clean-cut, punched-out circle in the palm, of the size of a split-pea, with a pink, soft, dry floor, covered with thin epithelium, and an undermined, whitened border of thick, raised epithelium, surrounded often by a red areola. This is the *syphilide cornée* of Hardy. These spots often get well without spreading. They differ from the scaly syphilide of the palm, which usually occurs later in the disease. Sometimes, however, these spots are attended by fissuring and undermining of the epidermis laterally, and several spots may coalesce. This is not the rule, but exceptional.

There is a large, flat form of papular syphilide sometimes encountered

upon the body, but most apt to be found upon the face and scalp. The papules are as large as the finger or thumb-nail. In the scalp they itch. They are of a pale pink color, desquamate readily. Around their edge the epidermis gets raised by a slight effusion of serum, while the adherent cuticle, bound down centrally in the large lesion, gives the whole an appearance of umbilication which is characteristic, and not found, so far as I am aware, in a lesion due to any other cause than syphilis.

A flat, livid papule, sometimes excoriated, sometimes dry, is occasionally found indifferently situated upon the skin.

When papules lie in creases in the skin, so that they are constantly covered by other portions of integument (under the breast in the female, in the groin in fat persons), and are thus kept warm and subject to friction, they are apt to become very large and flat. They sometimes run together into patches, and become moist on the surface. They may become exuberant and granulate. Under these circumstances, the papule becomes the mucous patch of the skin—the flat condyloma. They are common about the anus, the scrotum, the labia. The gray pellicle upon the surface of these lesions recalls the typical mucous patch of the mucous membranes very exactly; and the rank, offensive odor of their discharges, when retained, about the anus, genitals, groins, under the breast, or between the toes, has something characteristic about it, which is almost as distinctive as is the smell of small-pox. The true mucous patch of mucous membranes is indeed a papule, and the papule on the skin is customarily associated with the mucous patch upon the mucous membranes.

Just as mucous patches upon mucous membranes may ulcerate, the ulcer eat into the substance of the tissue bearing it, and a scar result, so may it happen to a moist condyloma of the skin; and the ulcer, once started, may spread far beyond the limits of the original lesion. This, however, is not a common occurrence. It is more apt to happen to mucous tubercles about the throat, the anus, or the genitals, than elsewhere.

Dry papules of the skin sometimes run together and scab over, their surface being somewhat warty and covered with crusts. This condition is best seen in the furrows bordering the upper lip, and in the moustache about the nose. Occasionally large patches of papules run together and vegetate, resulting in a raised raw surface, which finally scabs over and eventually scales.

The secretions from moist papules on the skin are contagious, and, on account of their widespread distribution, these papules are more dangerous than even the primary lesion of syphilis. The discharge is also auto-inoculable, especially if the surface of the papule be irritated and made to discharge pus. Under such circumstances auto-inoculation may produce an ulcer resembling chancroid. Spontaneous auto-inoculation of a moist syphilitic papule produces another moist syphilitic papule. This is frequently seen clinically.

The papules in the syphilitic negro are generally hyper-pigmented on their summits or around the base. Taylor[1] has reported (Fig. 3, after 104, Fox) two cases in the negro, showing the white color produced in some cases by the scales upon the papules during desquamation.

The duration of the papular syphilide is very variable. It may come out as the first eruption, either alone or mixed with the roseola, and continue for a period varying from a few weeks to many months. When apparently getting well, it sometimes suddenly relapses without

[1] *Am. Jour. of Syph. and Derm.*, Vol. IV., No. II., p. 107.

apparent cause. The lesions on the palms and soles, especially if they run together into patches, are particularly obstinate.

Treatment greatly affects the duration of all forms of papular syphilide. Local treatment is often especially valuable (p. 128), particularly for papular lesions upon the cheeks or forehead (corona veneris)—situations very apt to be occupied by papules, which seem to run an especially slow course in these localities. Local treatment, properly adapted to the lesion, certainly modifies all forms of syphilitic eruption.

Syphilitic papules, unless they ulcerate, leave no scars. They frequently leave pigmented areas behind, marking the site of the lesion. The pigment slowly disappears with time, sometimes centrifugally leaving a pigmented margin, which may persist long after the centre has become whiter than the surrounding skin. The color is most apt to be marked in dark-skinned persons upon the naturally pigmented skin about the anus and genitals.

The diagnosis of papular syphilide is very easy in typical cases, especially if the eruption is copious, and other concomitant signs of early syphilis are present.

Difficulties may arise, however, when there are only a few papules. A few acuminated papules can—with difficulty, if at all—be distinguished from indolent papules of acne, found after middle life in gouty people of dark complexion. The pigmented area surrounding the site of a papule which has run its course is suggestive, but not pathognomonic, of syphilis. In some cases the result of treatment alone will justify a diagnosis. A mixed treatment cures the late scattered syphilitic papule in every case where the stomach is in a fair state, while the acne upon a rheumatic, gouty patient is not at all favorably influenced by such a course.

Fig. 3.

Flat papules, when occurring in an isolated way, late in syphilis, are also indistinguishable from similar isolated accidental lesions, due to indifferent causes, upon rheumatic subjects. Treatment here again becomes the most valuable aid to diagnosis, or better still, observation, since isolated syphilitic papules do not reproduce themselves indefinitely, while upon certain gouty subjects they recur from time to time with reasonable regularity.

Lichen planus, of all eruptions, is with the most difficulty differentiated from a papular syphilide. The color is identical, and many other features are the same. The most positive distinguishing marks are the umbilication of many of the solid papules of lichen planus, their wide difference in size, their very marked tendency to run into patches, and their tendency to arrange themselves in lines with healthy skin between the different lesions rather than in circles, as is the case in syphilitic disease. Moreover, with lichen planus there are no concomitant symptoms of syphi-

lis found in the lymphatic glands or on the mucous membranes, which could hardly be the case in an eruption of syphilitic papules of like intensity. The palms and soles are much more apt to be spared in lichen planus than in a syphilitic papular eruption.

FIG. 4.

The flat-raised papule (condyloma lata) generally accompanies other syphilitic lesions, and is relatively easy of diagnosis. When seen alone about the anus, as in Fig. 4 (after 29, Fox), a doubt sometimes arises as to whether the lesions may not be the ordinary vegetations, the so-called venereal warts, which are apt to be found in connection with gonorrhœal, leucorrhœal, and other discharges—indeed, complicating all manner of uncleanness.

The venereal wart is more uneven on the surface than the condyloma lata, more split up and segmented into pointed papillæ, like the ordinary "seed wart." A large cluster of them may grow off from the skin in a pedunculated manner. Their color is apt to be more brilliant than that of the syphilitic papule, and their situation is less frequently the anus or scrotum. They lie most often within the ostium vaginæ in the female; under the foreskin in the male. Mention will be made again of these warts in connection with the study of gonorrhœa. They may occur as a complication of true mucous patches under the foreskin, in the vagina, at the anus.

Treatment is that of secondary syphilis by mercury.

THE PUSTULAR SYPHILIDE.

The pustules of early syphilis are found in two varieties: (1) small, scattered or grouped, arising within a follicle, or occurring independently upon an intervening portion of skin; (2) upon an inflamed base, but still superficial, not gummatous (superficial ecthyma).

The small pustule has no very distinctive marking. It is apt to be generalized over the whole body in early syphilis, and usually indicates such a pus-forming quality of constitution in the patient, that the course of his subsequent syphilis may with reasonable confidence be expected to be bad.

The pustular syphilide may come on as the earliest eruption at six weeks, but it does not usually appear before as many months. The scattered pustules found among a number of vesicles, papules, and erythematous spots in the polymorphism of the first eruption, do not constitute a pustular syphilide. In the latter the type lesion is the pustule, grouped or discrete. The lesions are found scattered over the whole body, in the scalp, upon the face, upon the fingers and palms, over the whole trunk and extremities. Very often the sebaceous follicle is involved, and then a hair is seen to project from the summit of each pustule. They vary greatly in size, take severally from one to three weeks to reach perfection, and *then they usually* break and scab, or dry down and heal up under the lit-

tle crust. When they run together into superficial patches, they behave in much the same way.

When the dried-up scabs fall away the livid thickening of the skin remains for a considerable period marking the sites of the lesions. These livid papules (for such they are) may be marked by a central depression—the hole left by the suppurated follicle—if the pustule has been pierced by a hair; or they may remain ulcerated on top for a time, finally yielding a thin, white, round scar. A ring of pigment around each separate healing lesion in pustular syphilis is rather the rule than the exception; but the pigment finally disappears, and the scars are often so faint that it becomes hard to detect even traces of them in later years. Groups of superficial pustules are much more rare than numbers of discrete pustules.

The pustular syphilide is slow. Crops of pustules come out at different times, relapses are not uncommon; and, unless treatment aided by tonics shortens the duration of the affection, it is apt to drag itself along during several months.

The diagnosis of superficial pustular syphilide is generally easy from the concomitant symptoms and history. Iritis is apt to complicate it. The bronzed areola of the subsiding lesion is a great help to diagnosis. A generalized, pustular, superficial, discrete eruption is very rarely due to any other cause than syphilis, and the appearance of such an eruption should immediately suggest an inquiry into the patient's previous history.

The superficial ecthymatous syphilide (Fig. 5) is a little deeper, a little more intense, being more deeply seated than the simple early pustular syphilide. It indicates that the patient has a bad type of syphilis, especially if it comes on early. It generally appears as late as during the second year—late enough to be called tertiary; but in bad cases it often comes on early, within a few weeks of chancre, and it leaves a faint scar, not indicating any considerable destruction of tissue. Occasionally, on the other hand, it accompanies early malignant lesions in very bad syphilis, and destroys considerable tissue, which of course necessitates a deep scar.

This syphilide starts as an infiltration of a limited area of skin capped by a pustule, or of a patch of skin upon which several pustules appear, at first discrete, later confluent. These pustules are generally large and flattened; they may even be umbilicated, resembling variola. The pustules develop rather slowly, with little or no pain, and finally scab, an ulcer existing under the scab for some time after the latter has formed. The pigmented areola comes on during the latter part of the development of the pustules. The scar remains long purple, often raised and thick, generally pigmented, and sometimes pitted, the pits representing different follicles which have suppurated. Finally the scars become perfectly white, more slowly upon the lower than upon the upper extremities.

The diagnosis of this form of syphilis is not difficult except in occasional cases where, as sometimes occurs, fever runs high with the first outbreak of the pustules, and where umbilication is marked. A mistake has been often made in such cases, and the patient has been sent to a small-pox hospital. Several instances of this error have come under my notice. The mistake may be avoided by noticing the more sluggish development of the syphilitic pustules in crops, the absence of intense pain in the back, the history of the case, and the concomitance of other (mouth and glandular) evidences of syphilis.

Cachectic ecthyma upon a young person with a dark skin often

cannot possibly be differentiated from superficial syphilitic ecthyma by a study of the lesion alone. The areola of pigment may be perfect upon the cachectic, probably lousy, pauper encountered in hospital practice, and suffering from simple ecthyma. A close study of the history and accompanying symptoms is the only guide to a safe diagnosis. Anti-

FIG. 5. After 7, Fox's photographs.

syphilitic treatment, quite effective in syphilitic superficial ecthyma, is powerless to oppose a continuance of the cachectic form.

The superficial ecthyma of early syphilis differs from the deep ecthyma of late syphilis, in that the latter is a gummy infiltration of the true skin, has a livid, hard base, and always leaves a depressed, round, white, thin, smooth, unpitted scar.

Treatment is that of secondary syphilis by mercury (p. 117).

THE PIGMENTARY SYPHILIDE.

This eruption, the very existence of which is questioned by some authors, while its syphilitic character is doubted by many who acknowl-

edge its existence, was first accurately described by Hardy, later by Fournier. Quite recently Atkinson,[1] of Baltimore, and G. H. Fox,[2] of New York, have contributed valuable essays to the literature of the subject.

This syphilide is simply a coloration of the integument, varying from a light dirty brown color to almost a black, a mottling formed of patches, light and dark. The light areas of skin are sometimes of a natural hue, sometimes whiter than the original integument, meriting for the affection the title of vitiligo, according to Fox, who has one dark-skinned Italian patient among his photographs, illustrating the blanching of the skin upon the sites of the lesions without hyper-pigmentation around.

The conclusions arrived at by Fox, as to the method of formation of the pigmentary syphilide, are very interesting. They are based upon the close study of several cases, and, although not proved yet, they are so plausible that their truth seems more than probable.

The accompanying diagrammatic sketch has been furnished me by Dr. Fox. If these views stand the test of observation by the profession at large, another of the minor mysteries of syphilis will have been solved.

In Fig. 6, the round spot 1 represents the red syphilitic macule or papule; 2 is the pigmentation which follows in many cases; 3 is the dark centre, the "bull's eye," as Dr. Fox calls it, which he has noticed to remain in the centre of the white area as the pigment was being absorbed peripherally; 4 shows the "bull's eye" also absorbed, as well as all the pigment originally occupying the site of the lesion, while there remains generalized peripheral hyper-pigmentation in the intermacular spaces.

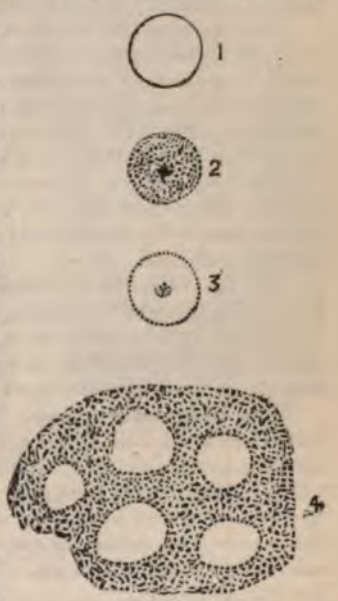

FIG. 6.

The dark patches are quite irregular and vary much in size, their festooned borders running into each other and making the irregular mottling already referred to. The eruption is generally found upon the sides of the neck, in front, and on the upper part of the chest; exceptionally elsewhere, as upon the trunk, the hands. It is generally ignored by the patient, and often only discovered through accident by the physician, or after careful search. Lymphatic, fair-skinned women, according to Hardy and Fournier, are most apt to have this eruption; but men also have it, and sometimes very dark-skinned patients (Fox).

No one has ever watched it develop; but Fox has marked certain papular lesions on the neck, and found the white mottlings, afterward, to correspond to the sites marked out by the forerunning eruption. The lesion has been considered, also, to be the lesion left behind by a roseola, and at best it is an obscure affection of but little moment. As corroborative of past syphilis, it may be of some value. It comes on anywhere in the second half of the first year after chancre, and may last many months, but it always finally disapears. It is totally devoid of any subjective

[1] Trans. Am. Dermatological Society, 1878.
[2] Am. Journ. Med. Sci., April, 1878, p. 356.

symptoms, and absolutely uninfluenced by treatment. It cannot possibly be mistaken for anything except dirt, pityriasis versicolor, freckles, or leucoderma. The first of these washes off; the second itches faintly, is a little branny, and furnishes spores for microscopic diagnosis; the third are more yellow, and never confined to the limited region of the sides of the neck and upper part of the chest. Leucoderma of the common sort has a different distribution.

THE VESICULAR SYPHILIDE.

This eruption is rare. Its date of appearance is late in the secondary period, generally during the second year after chancre.

The vesicles may be of varied size, but generally are small, acuminated, scattered about the trunk and extremities (the face being spared), or clustered into groups in circles, or segments of circles, upon a livid base of characteristic syphilitic color. Each of the lesions may be surrounded by an areola, at first livid, then coppery, and the vesicles may dry up and scale, or become purulent and scab over.

There is a form of vesicular syphilide coming on earlier (within six months after chancre), the vesicles being large, umbilicated, upon a reddened base, with an areola at first livid, then coppery. The vesicles quickly become purulent.

All the vesicular syphilides are slow in evolution and apt to be prolonged by successive outcrops of new vesicles and clusters of vesicles continuing to appear as the first dry up. The livid spots left by the vesicles gradually whiten and leave either no scar or pitted cicatrices, each pit representing the original site of a vesicle.

The diagnosis is easy. The umbilicated vesicle may suggest varicella, but there is no itching except in the scalp, and other syphilitic lesions are apt to accompany this umbilicated form of the eruption, which comes on early in the disease if at all. The generalized vesicular syphilide does not become confluent and yield an oozing surface as does eczema. The color, the areola, the grouping, the absence of itching, distinguish it easily from other vesicular eruptions. Treatment is that of secondary syphilis by mercury (p. 117).

THE SQUAMOUS SYPHILIDE.

The squamous syphilide, except upon the palms and soles, is usually a papulo-squamous or a tuberculo-squamous eruption in infiltrated rounded patches of livid form, or with a circinate distribution recalling ringworm (Fig. 7, after 226, Fox). The scaling which occurs as the last stage, in a variety of eruptions due to syphilis, cannot be called a squamous syphilide, and the pityriasis accompanying alopecia due to syphilis is manifestly unworthy to be called a squamous syphilide.

The papulo-squamous syphilide occurs toward the end of the first year of syphilis, or at any period later. It may come on long after the tertiary stage has set in, after gummata have appeared, after bone disease has been inaugurated and cured. Long after the patient thinks himself well, several years perhaps after the appearance of any symptom due to syphilis, an elevated patch of squamous syphilide may appear upon the face and be *unjustly* called a lupus by the physician,—or a circinate scaly eruption

comes out upon the scrotum, and here the patient looks upon it as a ringworm.

Solid patches of squamous syphilide may occur upon the face or any part of the body. The skin is thickened, more or less livid, often not distinctly papulated, but infiltrated. The size and shape of the patches vary greatly, from small dots to broad, rounded sweeps of eruption as large as the hand. The livid surface is covered with fine white scales, which are not tightly adherent. These scales shed off and are replaced by new crops, until finally the infiltration disappears and the patch gets well, leaving no scar. If the patch has been positively tuberculated as well as scaly, round scars, not much, if at all, pigmented, are apt to be scattered over the livid scaly area covered by the eruption, and these scars remain permanent after the affection gets well.

Fig. 7.

The circinate form may come on early or very late in syphilis, attacking any part of the body, but most common upon the scrotum, or about the genitals, in either sex. The circle, or segment of a circle, starts of a given size, and does not increase like ringworm. A number of segments of circles often run into each other, making a festooned, gyrate figure. The border of the circle forming the eruption varies in breadth up to about a quarter of an inch; generally it is but little wider than an eighth of an inch on the scrotum. The skin enclosed by the segments of circles remains sound. The border of the circle is generally distinctly papulated, some of the papules being dry, some moist, some scaly, some scabbed. About the genitals patients sometimes assert that the eruption itches.

When this eruption occurs early in syphilis, it is apt to coincide with other manifestations of the disease; later, it may be solitary. The later it appears, the slower it is in evolution. It does not leave a scar.

Diagnosis in squamous syphilis is often difficult. Coincident symptoms of syphilis, and the history, together with the common situation along the roots of the hair on the forehead, about the genitals, etc., help to make a diagnosis which the effect of treatment will promptly justify if it has been accurate. In color, on the other hand, and general arrangement, patches of squamous syphilide are sometimes quite indistinguishable from some forms of psoriasis, and a localized patch on the face is sometimes nearly enough like erythematous lupus to deceive a practitioner not expert in the differential diagnosis of skin diseases. The circinate, scaly syphilide cannot long be mistaken for ringworm, since in syphilis the circle does not grow by centrifugal enlargement.

The palmar and plantar squamous syphilides are lesions of the first importance in connection with syphilis. There are several varieties of this eruption. One of them has already been described (p. 147), namely, the round, livid, dry spots on the palm, looking as if a piece of the epithelial layer had been cut out with a punch (Fig. 8, after 73, Fox), and the borders of the scarfskin afterward slightly undermined. Besides these spots, which are best observed in connection with a generalized papular

syphilide, other rounded and oblong scaly patches of the palm and sole are encountered in syphilis at almost every stage of the disease.

These are, with few exceptions, round and oval. The different lesions commence as livid, red areas, or as round, epidermal patches of a yellow color, according as congestion of the surface vessels or epithelial hyper-

FIG. 8.

trophy is the more pronounced pathological process. As the lesion progresses it spreads centrifugally, the epidermis fissures and scales off, and the different lesions run into each other (Fig. 9, after 77, Fox), making a large patch with irregular, rounded border. The centrifugal spread of the patches leaves a livid, pink centre, free from any special lesion other

FIG. 9.

than hyperæmia. Upon such central reddened spots, other rounded lesions, like those in which the affection originated, spring up, and in their turn spread centrifugally. In the natural furrows of the palm or sole, and at their border, deep fissures are apt to form in the edges of the eruption, *due primarily* to motion, and extending down into the bleeding true

skin. These cracks are aggravated by motion, and are the seat of considerable pain at times.

Friction upon the palm, as in rowing, using tools, etc., is an active, exciting cause of squamous syphilides in this region; much walking and ill-fitting shoes act in the same way upon the sole. In the latter region about the heel, in the very thick epidermis of that locality, the squamous syphilide sometimes occurs as a dirty, yellow, fissured condition of the epidermis, cropping over upon the thin skin under the ankle as a livid, scaly eruption bordered by segments of circles. In this region the scaly syphilide is often attended by pain, due to fissuring of the true skin, and is very slow in its evolution. Elevated livid tubercles, more or less scaly, also occur in patches upon the palm.

Symmetry is not the rule in either palmar or plantar syphilis.

Diagnosis of squamous syphilide of the palm and sole is difficult in some cases. Some forms of lichen urticatus, of eczema, and of psoriasis resemble it very closely. In the first and last of these affections, however, the plantar or palmar lesion is never found alone. The character of general eruption upon the rest of the body, therefore, clears up all doubt concerning the lesion in question. An eczematous patch, however, may be found exclusively confined to the palm. It is apt to itch, it is thinner at the edge, shades off into the surrounding integument more than the syphilide does. It is not so livid in color, and has no purple border, as is sometimes the case in the syphilide. Eczema is more irregular, less rounded in outline, much more chronic in duration, as a rule, and apt to extend out over the palm upon the softer skin around.

Local treatment is of great value, as well as general treatment, in this affection. The tuberculo-squamous patches generally require mixed treatment (pp. 117, 128, 137).

THE TUBERCULAR SYPHILIDE.

This syphilide occurs in two forms—generalized, or in groups. The generalized form is quite unusual, that in groups very common. The former rarely occurs before the second half of the first year, from chancre; the latter quite exceptionally before the second year. Isolated patches of tubercle may come on at any date, many years after all traces of the disease have disappeared.

The general tubercular syphilide is not the papular syphilide in which the papules are large. The tubercle is really a gummatous product. It develops deeply down in the tissue or the true skin beneath the papillary layer. It is not a gummy tumor of the subcutaneous tissue. When it occurs as a generalized eruption, it does so as an eruption of patches and groups of clustered lesions in circles and segments of circles. Some of the patches are the result of a confluence of many tubercles, and then the patch is a solid livid elevation of the skin, uneven on the top, and covered with scales. Each separate lesion, if it stands alone (Fig. 10, after 103, Fox), is livid in hue, capped with a scale or a small pustule, and often surrounded by a livid areola, afterward becoming coppery. The different tubercles vary in size from a grain of rice to a good-sized pea, and they usually leave a cicatrix when they disappear, whether their surface has been ulcerated or not. The scar is at first livid, then often pigmented, then white, round, thin, smooth, depressed, not at all retractile.

The diagnosis is easy. It is hard to imagine an eruption with which the tubercular syphilide could be confounded.

The tuberculo-squamous or tuberculo-ulcerated syphilide in groups is a late lesion. It is, indeed, positively tertiary, but often occurs upon the border-line. The face is a favorite seat of the eruption, but it may occupy any part of the body, as shown in Fig. 11, after 108, Fox. Livid patches of thickened skin constitute the eruption.

Scales upon these patches are quite obvious, but the tubercles may be

FIG. 10. Generalized tubercular syphilis.

scarcely so, perhaps not visible at all. Sometimes the only reason one has to call the affection tuberculo-squamous, is the existence of round, white, depressed scars upon the surface in among the scales, of the size of a pea, marking the site of tubercular infiltrations of the true skin, with gummatous material, the interstitial absorption of which has produced the white scars. Generally the tubercles are quite plainly visible upon the surface. Sometimes they stand apart, sometimes they run together and enclose areas of healthy skin within raised circular borders.

The evolution of the patch is by the circumferential growth of new tubercles. Those first formed disappear, leaving scars without previously ulcerating, and upon the old spots where former tubercles have flourished and gone away new ones may crop out later and go slowly through their changes, leaving scars behind. Ringworm may be simulated by circinate patches of tuberculo-squamous disease.

This syphilide is maintained by the successive outcrop of new tubercles, and a single patch may thus be prolonged for years. Sometimes the gummatous infiltration which forms the tubercle goes on so rapidly that the integrity of the integument is compromised, ulceration takes place, and a serpiginous ulcer results, as after the pustular syphilide in groups.

FIG. 11.

The diagnosis of tubercular syphilide in groups is very easy if attention be paid to the central cicatrices in the patch. These are round, white, smooth, and not puckered. In tubercular non-ulcerative lupus this quality of scar is not observed, the cicatrix being puckered and linear. This feature alone is all that is required to make a distinction. The lividity of color is much more marked in syphilis than in lupus.

Treatment is mixed, both iodide of potassium and mercury being required (p. 137). Local treatment is serviceable (p. 128).

TERTIARY SYPHILIDES.

The final three sets of eruptions to be considered—rupia, ulcerative syphilis, and gumma—are strictly tertiary; they all call for mixed treatment, and generally for the iodide of potassium in excess, if it is desired to subdue them promptly. They all occur habitually in the second year of the disease and later, and they uniformly and inevitably destroy the structure of the true skin and leave scars. Treatment postpones their outbreak, or may prevent them from appearing at all.

Eruptions of this kind may be ushered in while the patient is enjoying apparently the most flourishing health. They are all painless, unless they involve a bone or joint, as well as the integument. Sometimes they accompany that profound cachexia, produced by syphilis, which is often observed in hospitals upon patients with visceral disease due to late syphilis. The cachexia always indicates a profound alteration of some of the internal organs, when it appears late in syphilis, and does not usually stand in any immediate relation of cause to the eruption, or of effect of the eruption, be it rupia or ulcer, for the same cutaneous lesions may be found upon patients who present no evidences of cachexia whatsoever. Rupia, however, whether the patient shows cachexia or not, indicates a

very bad quality of constitution, and calls for tonic remedies and cod-liver oil, as well as for the mixed treatment, suitable to the stage of the disease in which it occurs.

THE PUSTULO-BULBOUS SYPHILIDE (RUPIA).

A scattered bulbous eruption has been occasionally encountered in secondary syphilis, about the hands, feet, and elbows, but it is met with so rarely that it may be considered a pure exception. In inherited syphilis the bulbous lesion is not uncommon, and it will be described in connection with that branch of the subject.

Rupia, Fig. 12 (after 27, Fox), the eruption now under consideration, sometimes starts as a flat pustule, sometimes as a bulla. The patient may look fat and seem healthy, but he is not so, or he could not have rupia. If a bulla first forms, it runs on quickly to suppuration, and blood becomes mingled with the pus. The first lesion thus formed scabs over, and under the scab ulceration commences, yielding pus, which raises the scab from its bed. Meantime around the scab first formed an epidermal raised ring appears, filled with sero-pus. This dries down into a blackish green scab, enlarging the first crust, while ulceration goes on beneath the whole. A new sero-purulent sub-epidermal collar forms again around the lesion, and the process goes on repeating itself.

The new layers of pus supplied from beneath, raise and thicken the

FIG. 12.

scab, and if this process continues long without much increase in the area of the patch by the formation of circumferential bullæ, as may be the case, a horn may be formed sometimes an inch long or more, and in any case the roughened crust comes to bear a close resemblance to an oyster-shell.

This oyster-shell is attached at the borders, but not by its under surface, and pressure upon it generally causes pus to ooze out at one of the edges of the sore. If the scab gets detached another may form, or the lesion may progress as an open or a partly scabbed ulcer, with a livid or pultaceous base and sharp-cut borders. Sometimes cicatrization goes on under the scab, which finally falls off, leaving a livid cicatrix, generally covered with ridges, drawn and puckered in part, sometimes surrounded by a coppery areola, sometimes having only a livid border. In almost all cases the scars eventually become white.

Treatment must be tonic in all ways and mixed with iodides in excess. Local treatment of the ulcers, when the scab falls, is of considerable value (pp. 128, 137).

THE TERTIARY PUSTULAR SYPHILIDE.

In tertiary disease the pustular syphilide is found in two forms. As a pustule with an infiltrated base, ecthyma, and as a patch of pustules beneath which destructive ulceration goes on.

The deep ecthymatous pustule is a general gummy infiltration of the skin, capped with a pustule, which usually goes on to ulceration.

The gummatous thickening of the skin is obvious in the case of single isolated ecthymatous lesions, but it becomes lost as the single lesion ulcerates, or the patch of ecthymatous pustules spreads. When this thickening is present it exists as a lurid, painless, hard lump, often surrounded by a bronzed areola, especially upon the lower extremity, as the isolated ecthymatous spot gets old.

The thick green crust which forms upon the top of an ecthymatous pustule resembles a rupial crust. Its edges are thin, and frequently are depressed beneath the level of the surrounding skin, making the latter look like a setting which holds the scab in place. These scabs are quite adherent, and may remain attached until cicatrization is complete. The ecthymatous lesions of the patch in Fig. 13 (113, Fox) are partly scabbed, partly cicatrized.

The cicatrix of a single deep ecthymatous spot is the typical syphilitic scar, smooth, thin, white, depressed, non-adherent. At first it is livid, and it remains in most cases surrounded for a long time by a border of pigment.

The favorite seat of deep ecthyma is the lower extremities—but it may be found anywhere upon the body, and is not uncommon on the face.

FIG. 13.

When several ecthymatous lesions run together, an ulcer may result, which may become serpiginous, and creep over a considerable extent of surface, often getting well on one side as it advances toward the other.

In ecthyma the mixed treatment is appropriate, together with mercurials locally (pp. 128, 137).

Ecthyma does not necessarily indicate a bad condition of the patient.

The pustular syphilide in groups generally comes on late in syphilis. A red spot appears, which quickly becomes covered with small pustules. These run together and scab, and beneath the scab ulceration goes on. As the ulcer grows, so does the scab, and if the latter falls off, or is removed, a new one forms. The secretion beneath the scab is scanty, and the crust, therefore, does not become rupial.

Finally, when the patch has reached a considerable size in some cases, the new pustules around the edges upon the livid areola cease to form, the whole patch dries up and contracts, cicatrizing under the crust. When the latter falls, a livid scar is left, with a bronzed areola. The centre whitens, the areola generally, but not always, disappears.

Fig. 14 (Fox, 40).

A serpiginous ulcer may result from this lesion, as it may from ecthyma, or from rupia.

An error in diagnosis is not probable. The pustular scrofulide generally comes early in life, and the lesion with its ulcer have different characters.

Treatment is mixed internally, with the iodide in excess (p. 137). Local treatment is quite effective in this eruption, and its rapid influence is much to be desired, since the eruption may occupy the face.

The syphilitic tertiary ulcer is not an especial affection. It is a second stage of rupia, ecthyma, patches of tubercles, or of pustules, or a sequence of gummy infiltration, or of gummy tumor of the skin. Figs. 14 and 15 indicate favorite sites and appearances of syphilitic tertiary ulcers; Fig. 16 represents moderately well the appearance of typical syphilitic scars.

The ulcer always has similar characters, whether destroying in depth, or running superficially upon the surface (serpiginous ulcer). The ulcer has perpendicular edges, hard, livid, (generally) adherent borders, a livid, pultaceous floor (sometimes smooth and shining), and often a hard base. These lesions are painless for the most part, unless they involve the periosteum from being situated over it, as on the shin, or unless they become inflamed from injury, or by position, as on the lower extremity.

Fig. 15 (Fox, 70).

The syphilitic ulcer may remain stationary, it may eat downward, exposing a bone, destroying the periosteum, and leaving a piece of bare bone in the floor of the ulcer. This bone, at first white, becomes black. It often dies, gradually separates from the healthy bone beneath, and is thrown off. The deep, destructive ulceration which deforms the nose generally follows a gum-

my tumor or gummatous infiltration. The same may be said of the destructive ulcer of the penis.

Serpiginous ulcers are those which spread superficially, either in all directions, or, advancing in one direction, get well in the other.

Around joints, and on the lower extremities, syphilitic ulcers may remain for years, perhaps, untreated, until the end of life. They yield, however, to well-directed internal mixed treatment, with iodides in excess, and to intelligent local means, pressure, mercurials, iodoform, etc., p. 130.

FIG. 16 (FOX, 110).

Great care must be exercised to distinguish a tertiary ulcer upon the tongue or lip from an epithelioma, upon the penis from a phagedenic chancroid or an epithelioma, upon the nose or face from an ulcerative lupus or a rodent ulcer. The peculiar characters of syphilitic ulcers, so often already detailed, ought to be sufficient to guide to a diagnosis in most cases. In all cases of doubt the touchstone of treatment, if intelligently applied, will clear up the question promptly. In nearly all cases of tertiary ulceration, except when it occurs upon the lower extremities, and is already old, and when it comes on in connection with profound cachexia; in nearly all other classes of cases internal treatment alone is promptly effective of good results, although local measures may greatly aid the healing of the sore.

GUMMA OF THE SKIN.

Tubercular and ecthymatous patches are certainly the seat of gummatous infiltration. There is also a true gumma of the skin, which appears as a general infiltration, and another form which takes the shape of a circumscribed tumor. Either form may ulcerate; the latter habitually does so unless arrested by treatment.

Diffuse gummatous infiltration of the skin is not common. It occurs as a patch of livid redness, hard, raised, somewhat scaly on the surface, perhaps for a long time smooth and shining. Upon this surface, little prominences may appear, which quickly ulcerate. The ulcers run together and behave like the syphilitic ulcers already described, remaining stationary, or becoming serpiginous, but not destroying in depth. Rarely the patch sinks away, leaving a general thinning of the skin behind, but no distinct scar, as such.

Gummatous infiltration of the skin presumably precedes all ulceration of the serpiginous sort, whether coming on as a sequence to rupia, ecthyma, or any other lesion; and the infiltrated patches bearing tubercles, scales, or pustules, owe their infiltration undoubtedly to an analogous pathological condition.

The gumma proper of the skin is, strictly speaking, the syphilitic tubercle. The gummy tumor, yielding an ulcer on the skin, is generally a localized accumulation of gummatous cells in the subcutaneous connective tissue. These are first noticed as hard, shot-like bodies beneath the skin. They are absolutely insensitive upon manipulation. The skin

is freely movable over them, and they themselves are not attached firmly to the surrounding or underlying parts. In this state a subcutaneous gumma may remain for months, and sometimes gradually disappear, even without treatment, leaving no apparent trace of its former existence. Generally, however, unless treatment intervenes, the lump gradually enlarges, attaches itself to all the surrounding tissues, softens centrally, and the detritus of gummy matter slowly but surely ulcerates its way to the surface.

The skin over the tumor, in such a case, becomes livid and thin, the soft central spot finally gives way, and the contents of the tumor escape, not as pus, but as a more or less thick, honey-like material, of a grayish yellow color tinged with green, and mingled with more or less blood. This detritus is composed of broken-down gummatous cells, and the débris of the intervening tissue which was infiltrated with those cells. After discharging, the gumma remains open as a deep syphilitic ulcer, which generally gradually heals, leaving a characteristic scar. Subperiosteal gummata are often painful. They may remain long stationary, and, finally ulcerating, be followed by the death of large portions of bone, generally the superficial layers, which become, later, slowly necrotic.

Gummata of the nose are very apt to lead to perforation, destruction of bone, and permanent deformity. Gummata occur over the whole body. Local traumatisms seem sometimes to call them into existence.

Wherever the gumma occurs, the tissue which is implicated is certain to be destroyed. The new round and fusiform cells are usually incapable of organization beyond a certain point, and when the tumor has reached a certain size it deliquesces, and its wasted elements and the tissues lying between them seek a way to the surface, or they are absorbed—first the watery, later the solid parts—through the instrumentality of granulo-fatty degeneration. The remains of the solid parts may become cretaceous and encysted, and continue in this state indefinitely. Sometimes gummatous exudation is entirely absorbed, leaving behind a cyst containing a little fluid. This termination is exceedingly rare.

Sometimes gummy deposit undergoes fibrous transformation (around the dura mater, interstitially in the different organs, notably the lungs), but this peculiar form of retrogressive metamorphosis does not seem to obtain in the case of gummy tumor of the skin.

Treatment of gumma, wherever it occurs in the body in the form of a distinct tumor, is by the iodide of potassium; all the iodides are the natural specific enemies of gummatous deposit.

CHAPTER IX.

SYPHILIS OF MUCOUS MEMBRANES.

Erythematous, Ulcerative, Mucous, and Scaly Patches, and Gummatous Ulcers of the Mucous Membranes of the Mouth, Nose, and Fauces.

THE mucous membranes of the body, as well as the outside integument, are affected by various lesions in the course of syphilitic disease. These lesions are few in number. Some of them occur early, some late in the disease, others at all times. They are, in the mouth, throat, and nose:

1. Erythematous patches with erosions and superficial ulcers (occurring at all times).
2. Mucous patches (occurring in the typical form only during secondary syphilis).
3. Scaly patches (occurring only late in syphilis).
4. Gummatous ulcers (occurring only late in syphilis).

ERYTHEMATOUS PATCHES, EROSIONS AND SUPERFICIAL ULCERS.

These lesions, most notable during the earliest general outbreak of syphilis, may yet appear in modified form throughout the disease, either in connection with the various eruptions, or independently. Often, during the syphilitic fever, when the lymphatic glands behind the neck just begin to be perceptible, before any eruption can be made out upon the trunk, careful inspection will show that the fauces are covered with a uniform redness, suggestive of a common sore throat. The main difference between this erythema and ordinary sore throat is that in the former the blush often occupies more particularly the under surface of the soft palate and is apt to be very distinctly punctate in character (recalling the erythema of scarlatinal sore throat). This redness may extend out of sight up into the nares and down below the pharynx. The Schneiderian membrane may be pretty uniformly involved, as in a common cold. More or less tonsillar hypertrophy accompanies this condition.

With this erythema the patient generally complains of more or less pain, and he may be temporarily deaf, or lose his voice for a few days.

In connection with this redness, excoriations may occur upon the lips, upon the throat, along the edges, upon the dorsum, and at the tip of the tongue. These excoriations, however, have nothing characteristic about them. They are much more apt to come on at indefinite periods late in the disease. Little, yellow, round, superficial ulcers, behind the lips, or on the tip or sides of the tongue, are matters of daily observation in a venereal clinique, at all dates of syphilis.

Peculiarly common after the lapse of several years, is an angry reddened excoriation of the sides of the tongue, far back near the root, on

both sides. This may exist for months without ulcer or scaly patch. It is kept up by smoking, and by rough edges of teeth, but occasionally occurs without the aid of either of these exciting causes. All of these excoriations are likely to be somewhat sensitive, especially that form occurring on the sides of the tongue, during the second year and later, in which the papillæ seem to be angry and irritated.

Local treatment is of the first importance in all mouth and throat lesions belonging to this class. These local means have been detailed in connection with the discussion on general treatment, p. 130.

MUCOUS PATCHES.

The typical mucous patch is a lesion found only in syphilis and in perfection, usually, only in early syphilis. It may come on simultaneously with the first erythema of the throat, and continue to appear from time to time throughout the secondary period; but it is commonly seen in greatest perfection in connection with the general papular syphilide of the integument. The forms occurring late in the secondary and during the tertiary period are usually scaly patches and excoriations, resembling the squamous syphilide more than the papule. The true mucous patch is a flat papule with a sodden epithelium capping it. Its connection with the papule has been touched upon in the description of the flat papular syphilide, where it was shown how any flat syphilitic papule, kept moist and sodden, becomes a mucous papule of the skin.

Cornil[1] has recently studied the "opaline mucous tubercle" minutely. As found upon the tonsil, he relates that the papillæ are hypertrophied, the epithelium thickened, the deeper tissues infiltrated with new cells. In the superficial epithelial cells he found cavities sometimes containing pus-corpuscles and numbers of nests of pus-cells between the epithelial scales. These little abscesses open from time to time upon the surface, and yield the secretion of the mucous patch. When many of the little abscesses break down together and become confluent, a disintegrated ulcerated surface remains. Upon the surface of this ulcerated mucous patch there may be a false membrane, but, according to Cornil, this membrane does not contain the microscopic organism found in diphtheritic membrane. The closed follicles, when the tonsils are the seat of mucous patches, are inflamed, the whole gland congested and hypertrophied.

Clinically speaking, the mucous patch is a round, or irregularly rounded, raised patch of a dirty white color, sometimes red and granulating, covered with a more or less puriform secretion. In size, they vary from a point to large, irregular surfaces, generally produced by the confluence of several patches, and capable of reaching almost any dimensions. They occur about the tonsils, and upon all the pharynx, within the lips, or upon the tongue, within the nose, and down in the larynx and trachea, where they have been repeatedly observed with the laryngoscope. Unless ulcerated or attended by surrounding erythema, they are painless. Often the patient is unconscious of their existence. When they ulcerate or inflame, they may become quite painful.

They relapse frequently, and continue to come out upon the mucous

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[1] Communication to the French Academy. Referred to in London Lancet, August 24, 1878.

membranes, either spontaneously, or, more often, as the result of local irritation—a rough tooth, smoking.

Mucous patches do not leave any scars unless they ulcerate, and even then, the ulceration being superficial, the scars are not well marked.

Something has already been said about mucous patches on the skin, at p. 148, in connection with the description of the papular syphilide. In addition, it may be said, when there is present a generalized, flat, papular syphilide, any of these papules may become a mucous patch upon the skin, if subjected to heat and moisture. Hence, the mucous patches about the scrotum, the anus, between the toes, in the groin, about the umbilicus in fat persons, and under the breast in the female. Under the prepuce, in the vagina in the female, and about the anus, mucous patches often arise independently of any general eruption. They are not uncommon upon the delicate skins of children. In short, wherever two surfaces lie together, especially if there be any secretion, and the parts be allowed to become dirty, if the patient is in the early stages of syphilis, mucous patches may be looked for. If the secretions from these patches be retained, they undergo prompt decomposition, and emit a foul odor. They may ulcerate about the anus, or between the toes, and become very painful. Vegetations may spring up around them, and they themselves may grow up so as to be large, pedunculated, flat warts (condyloma lata). It cannot be too often repeated that the secretions of mucous patches are laden with the poison of syphilis, and as capable of transmitting the disease as is the secretion of a chancre. A man or woman, with a mucous patch upon or just within the lip, is far more dangerous to the community as a focus of disease than two or three individuals with chancre. The local treatment of mucous patches, both of the skin and of mucous membranes, is very important. It may be found under the head of general treatment, p. 129.

SCALY PATCHES.

Scaly patches upon the throat, tongue, and the inside of the lips and cheeks, are very common during the second year of syphilis and later. They take the place of mucous patches, and are frequently called by that name. They may occur early enough in syphilis to be associated with the true mucous patch, but their natural position is later in the disease.

They appear as flat, rounded, irregularly shaped patches of a bluish white color anywhere within the mouth, but by preference at the angles of the lips, and on the tip, sides, and dorsum of the tongue. They are quite flat and insignificant-looking; but the patient learns to know them, and they cause him much uneasiness. They are manifestly due to epithelial thickening, and their whiteness depends upon this fact. Sometimes a limited patch (particularly under the tongue) will take on extensive overgrowth and yield an adherent white patch of epithelium as thick as a piece of blotting-paper, looking exactly like the disease called tylosis or icthyosis of the tongue. Sometimes these occur also in the angles of the mouth due to syphilis. Sometimes the entire dorsum of the tongue becomes covered with this scaly syphilide, giving it a mottled white and blue-white appearance which is not simulated by any other disease with which I am familiar.

These patches cannot be scraped off. They are not ulcers. If roughly handled they bleed. They are generally sensitive, although not seemingly inflamed, and when large patches exist in the mouth the contact of condi-

ments causes pain, and eating is only accomplished at the expense of great discomfort. Occasionally one of these scaly patches ulcerates, but this is not the rule.

These patches occur also in the vulva.

Smoking, chewing tobacco, all irritants applied to the mouth, the rough edges of teeth, lack of cleanliness, are exciting causes of the scaly syphilide of the mouth. These patches often occur long after all signs of syphilis have disappeared, and they yield to local treatment and do not call for a renewal of internal remedial measures. They do not necessarily indicate that the malady, perhaps long latent, is again to become active; but they do indicate that the syphilitic diathesis is not yet dead.

These patches sometimes so closely resemble true ichthyosis of the tongue, that a diagnosis by the physical characters alone is impossible. Generally the icthyosis has been of longer duration and is less sensitive than the syphilitic patch.

The mingled excoriations and scaly patches found not infrequently upon the tongue and in the mouth of persons having a tendency to dry eczema, once seen, could not be mistaken for a scaly syphilide. This condition is not common, and is encountered most often in the mouths of anæmic women. It is almost invariably aggravated at each menstrual epoch. Nothing of the kind obtains in syphilitic scaly disease of the tongue.

GUMMATOUS ULCERS OF THE MOUTH AND FAUCES.[1]

Besides the slight round ulcers and the irregular erosions of the mouth common to the whole period of syphilis, three other forms of ulcer claim description here, namely: the stationary, chronic, infiltrated ulcer; the serpiginous ulcer; and the ulcerative gummy tumor. All of these occur late in syphilis. The infiltrated ulcer is also found early in the disease.

The deep, ragged, brawny ulcer of the tonsil, found in syphilis, may be encountered early and late in the disease, alone and coincidently with other symptoms. It may originate in a mucous patch in early syphilis, or may start spontaneously in both stages of the malady. The ulcer occupies the tonsil by preference, usually is oval, with its long axis parallel to that of the tonsil. It may extend over upon either of the half arches, or upon the soft palate. It may, indeed, occur spontaneously at the angles of the mouth, inside the cheeks, or elsewhere. The base is pultaceous, the borders cut away, generally livid, sometimes pink, usually hard and accompanied by a sodden, livid condition of œdematous infiltration of all the surrounding tissues.

The ulcer remains stationary or progresses slowly. It often occasions great pain, especially upon swallowing, and is apt to be accompanied by a feverish state of the body, a furred tongue red at the tip, and often by considerable continuous, spontaneous pain, especially in early syphilis.

But little tissue is destroyed by these ulcers, and the resulting scars are not deep. Secretions from such ulcers in early syphilis are contagious.

The serpiginous ulcer occurs later in the disease, and is manifestly a gummatous infiltration. The seat of these ulcers is varied. The edge, or the upper part of the soft palate, is not infrequently involved, and

[1] Gummata of the tongue will be considered under the head of syphilis of the digestive organs.

quite often the back of the pharynx, high up, is the seat of disease. More rarely other parts of the mouth are affected. Not infrequently, with this form of ulcer in the pharynx, the larynx is the seat of tertiary syphilitic disease.

These tertiary, serpiginous ulcers do not constantly advance. They sometimes remain stationary for months, even years, upon the pharynx, giving very little pain, causing the patient to spit up a few bloody scabs in the morning, and attended by a dryness and an uncomfortable feeling in the throat. Sometimes it is necessary to hook up the soft palate with a carved probe, in order to find such an ulcer, or to use the laryngoscopic mirror.

Sometimes these ulcers advance rapidly, eating off the uvula in a few days, and destroying large portions of the soft palate by eating it away from the edge inward. When such ulcers get well they occasionally leave the pharynx much distorted by cicatrices.

The gummy, stationary, or serpiginous ulcer of the pharynx generally goes with a bad type of disease, and is often associated with profound syphilitic cachexia.

The local treatment of this form of ulcer is not very important. Fumigations are of some service, and the iodides internally are imperatively called for. Cleanliness is of great value, and the abandonment of tobacco.

GUMMY TUMOR OF THE MOUTH.

Gummy tumors may appear anywhere within the mouth. Gumma of the tongue will be described later. The gumma of the hard or soft palate is not uncommon, and is very dangerous on account of the damage it is likely to cause if unchecked.

A submucous, round, insensitive swelling first appears, not attended by pain. Perhaps the gummatous infiltration is diffuse over a limited area, and not concentrated into a single nodule. The growth of the gummatous material may be slow at first, but it is often rapid from the start.

When the tumor has reached a certain size, the mucous membrane over it becomes œdematous and rapidly gives way, disclosing a cavity which constitutes a gummatous ulcer like that seen upon the skin, with perpendicular edges and a deeply-situated grayish yellow floor. The diffuse infiltration in a similar manner may soften suddenly, and rapid ulceration sweep away quite an expanse of tissue.

The gummatous ulcer once formed destroys all the tissues in its path which have been infiltrated. Bone and cartilage offer no barriers to its march. Extensive destruction of tissue may ensue unless treatment intervent, and large portions of the roof of the mouth may be sacrificed to obscurity of diagnosis or lack of therapeutical boldness.

The odor of the ulceration in these cases, when the bone is involved, has something in it which is nearly pathognomonic. The same may be perceived when the bones of the nose are involved in gummatous syphilitic disease.

Whether these extensive throat-ravages, caused by syphilis, may not also be sometimes due to other pathological conditions (scrofula, lupus), has long been a question. My personal experience inclines me to the opinion that syphilis is their sole and only cause; but I am very well aware that there is excellent authority for the opinion that a scarred phar-

ynx, like that so often seen in syphilis, inherited or acquired, may be due to the previous existence of lupus of the pharynx, or of tubercular ulceration which has gotten well.

Atkinson, of Baltimore, in connection with an excellent case of ignored syphilis, has reviewed this question very ably, in the January (1879) number of the American Journal of Medical Sciences.

The local treatment of gummatous, destructive ulcers of the mouth and fauces is unimportant. The unsparing internal use of the iodides is the patient's main salvation. Any temporizing with such a case, or attempts to cure by local means, is unjustifiable. Sometimes enormous doses of the iodides are borne by these throat cases. When cachexia is far advanced, some of them become incurable.

CHAPTER X.

SYPHILIS OF LYMPHATIC GLANDS,

OF HAIRY PARTS, OF THE FINGERS AND TOES, OF MUSCLES, TENDONS, APONEUROSES, BURSÆ, JOINTS, BONES, AND CARTILAGE.

Epitrochlear and Post-cervical Indolent Glandular Engorgement.—Syphilitic Alopecia.—Syphilitic Onychia and Paronychia.—Dactylitis.—Syphilitic Myostitis, Congestive, Diffuse, Gummatous.—Syphilis of Tendons, Sheaths of Tendons, and Aponeuroses.—Syphilis of the Bursæ.—Syphilis of Ligaments and Joints.—Syphilis of Bones.—Osteocopic Pains.—Nodes, Dry Caries, Gummy Tumor of Bone.—Mercury as a Cause of Bone Disease.—Syphilis of Cartilage.

As has already been stated, the lymphatic glands receiving the absorbents from the region occupied by the initial lesion of syphilis undergo indolent engorgement. Then follows a rest (second incubation period), and then general syphilis.

At the commencement of general syphilis, usually before the outcrop of any general eruption, certain glands become indolently engorged and constitute valuable corroborative evidence of the syphilitic nature of any other symptom which may subsequently appear. Occasionally, all the lymphatic glands in the body seem to undergo slight enlargement at this period, but such changes are not pathognomonic.

The glands which are of clinical value in the diagnosis of general syphilis are the epitrochlear and the posterior superficial chain of the post-cervical glands, especially the highest two of the chain, those lying on the occipital bone, one on either side of the nucha. The post-aural glands are also often involved, and the lateral glands in the neck, but they mean nothing especial.

The enlargement of these epitrochlear and post-cervical glands is not due to any eruption, as is so often stated in text-books. Truly, the existence of an eruption may intensify their hardness and increase their size; but it is very common to find them in a typical state of indolent engorgement, when no eruption whatsoever has occupied the surface from which their absorbent radicles are derived. For the post-cervical glands it may be objected that the eruption is overlooked in the hair; but this surely cannot be said of the epitrochlear glands, since the palms and forearms can be minutely inspected. It is certainly the free poison in the blood which effects the indolent engorgement of these glands. Why these particular glands are especially modified by the disease, no one has attempted to explain. Some of the internal lymphatic glands are also involved in the earlier periods of syphilis, as has been proved by post-mortem examinations—Bärensprung, Virchow. By pressure of glands so enlarged, an attempt has been made to explain the jaundice occurring early in secondary syphilis.

The glands themselves need a little description.

They are as hard as bullets under the skin, freely movable in all directions, and not adherent to the skin. The integument over them is not colored, and they are insensitive to pressure, with occasional exceptions, when they first come out. They rarely get larger than a good-sized pea.

The duration of these glandular indurations is quite protracted. They appear about six weeks after chancre, and habitually last for months—but little, if at all, affected by treatment. Sometimes a trifling enlargement continues permanently, but all the characteristic syphilitic features of the glands disappear during the first year. Consequently, one should not expect the corroborative evidence of these glands in the case of an eruption supposed to be syphilitic, occurring later than the end of the first year after chancre.

I have seen symmetrical suppuration of the epitrochlear glands coming on spontaneously and having no connection with syphilis, but I have never seen the indolent engorgement of syphilis above described go on to suppuration.

Other glandular lymphatic engorgements do occur constantly in syphilis in various regions. In connection with mouth lesions, or spontaneously, one or more glands of the neck indifferently situated may suddenly swell up, remain enlarged for a long time, perhaps finally suppurating, or abscess may promptly form in a gland, running on to a speedy opening and discharge. Such abscesses in early syphilis generally get promptly well. Later, in scrofulous patients, they remain open and partake of the mixed characters of scrofulous and syphilitic ulcers, getting well very slowly, and yielding a scar possessing the mixed characters of syphilitic and scrofulous scars. I have seen such an ulcer upon a patient which had lasted more than a year. The patient had had a crop of glands successively ulcerating, the attack having lasted him five years when I first saw him. This long duration of his trouble had been due to inappropriate treatment, for he promptly rallied after efficient means had been employed.

Sometimes these glandular enlargements reach a great size, soften, but fail to discharge, and, not being opened, their contents dry up and are absorbed, a caseous, cretified mass being left behind.

These same changes in the lymphatic glands may occur in the groin, axilla, and elsewhere, but are most common in the neck.

Finally, tertiary glandular gummata are encountered in various glands, internal as well as external, which may ulcerate externally, forming gummatous ulcers, and may disappear by absorption, especially in response to treatment. The abdominal glands will be referred to again in connection with visceral syphilis, and the consideration of syphilis of the spleen and of the supra-renal capsules will be more appropriate there. Lancereaux speaks of enlargement and fatty degeneration of the thyroid body, due to syphilis, and gummy tumors have been found in it.

SYPHILIS OF THE HAIRY PARTS.

The alopecia of syphilis is a feature of early secondary disease, very often observed in connection with syphilitic fever and with the first eruption. It varies greatly in degree, being generally quite moderate and confined to the scalp, from which it thins out the hairs to a greater or less extent, while occasionally it is very severe, implicates the whole body,

and perhaps causes the shedding of all the hairs, even down to the lanugo.

This shedding of the hair in early syphilis is a mere accident, and not intrinsically a syphilitic symptom. It is the result of the anæmia of early syphilis, and is due to a failure of a full supply of nutrition to the hair-papillæ. The hairs dry up, lose their lustre, and numbers of them thin out just as they do after scarlet or typhoid fever. The scalp is either unaltered or covered with fine scales (pityriasis alba), or with masses of sebaceous matter mixed with scales (seborrhœa), with which the follicles around the hairs are stuffed. This loss of hair is never permanent when occurring in a young person.

Later in syphilis from cachexia, there may be a similar thinning of the hair, and in these cases the hair is less apt to grow again.

Finally, in cases of ulcerative disease, involving the hair-papillæ and destroying them, localized areas of baldness ensue, which are necessarily perpetual.

The treatment of syphilitic alopecia is a general treatment of syphilis—the treatment of that stage in which the alopecia occurs. There is much value in mercury both as a preventive to the fall of hair, and to arrest the fall after it has commenced in the alopecia of early syphilis. The cachectic form occurring later generally calls for mixed treatment combined with tonics.

One fact must be impressed upon a patient who demands a cure for his alopecia. At the moment of his application, many hairs are already dead, which still adhere to the head. They are retained in connection with the scalp by the root-sheaths, but are no longer united to their papillæ. These hairs are doomed. No power on earth can preserve them, and the sooner they are out the better, for the follicle will the sooner be ready to produce a new hair. Hence the patient's folly may be made clear to him, when he objects to brushing his hair or washing his scalp, on the ground that, when he does this, his hair comes out in handfuls. Let it come. These hairs must fall out. The patient deceives himself by supposing that he is injuring his prospects by brushing the dead hairs away. No amount of brushing or washing will dislodge a healthy hair, and the unhealthy ones call for speedy removal.

Consequently the patient should be told to wash his scalp thoroughly once or twice a week, either with soap, or with borax ʒ i. to the ℥ ij. of hot water, or with liquor ammoniæ, a drachm to the pint of hot water, according to the dirtiness of the scalp and the amount of seborrhœal exudation which it is desired to remove. Rather hard brushing with moderately stiff brushes is to be recommended.

Finally, a stimulating lotion should be rubbed every night, in small quantities, well upon the scalp, and into the follicles under the hair. Such lotions add a little to the chance of preserving the vitality of some of the hairs whose life is only threatened, and encourage the growth of the new hair. The following are good lotions:

℞. Chloral hydrat..... ʒ iss.—iij.
Tr. capsici..... ʒ vj.—xiv.
Glycerinæ..... ʒ ij.
Spts. myrciæ..... q. s. ad ℥ vi.
M.

Instead of the glycerine and bay-rum, oil of sweet almonds with co-

logne water may be preferred, as below; it is slightly more stimulating, and leaves the hair softer and less sticky.

℞. Tr. cantharidis..... ʒ iiss.—iv.
Ol. amygdal. dulcis..... ʒ ij.
Aquæ cologniensis.....q. s. ad ℥ iij.
M.

I have seen patients express great satisfaction with a lotion composed of equal parts of refined petroleum and lime-water, scented to suit.

SYPHILIS OF THE NAILS.

The nails are epithelial appendages to the integument, very similar to the hairs, and the results of syphilis upon them is analogous to what is observed in the case of the hair. If the early eruptions are intense the nails are apt to get thin, and to lose their lustre, to show more white dots than usual, and to become more brittle and liable to crack. Later in the disease, when the matrix of the nail is more positively influenced by the disease, all of these changes in the nail may be more marked, constituting a true dry onychia.

In onychia the nail first thins behind at the lunula. As it grows forward, ridges and furrows are seen upon it, parallel at first, and then converging. The nail, in this way, gets dry, brittle. It looks dirty and cracks easily, and is thin, wavy and irregular, from lunula to tip. This form of onychia, which Fournier has well described, is rare, but less rare than another form also observed by Fournier, in which, instead of thinning, the nail ceases to grow entirely, its tip continues to grow forward, but its posterior edge terminates abruptly in a free, jagged margin. In this manner the whole nail may grow off and be shed. A new nail, perhaps normal, possibly distorted in various ways, ultimately is produced to take the place of the lost nail.

A more common form of dry, syphilitic onychia, than either of the above, is that in which the nail, usually first at one side of the forward edge, becomes thickened, friable, crumbly, of a dirty, yellowish-white color. The whole thickened surface of the altered part of the nail cracks, fissures, and splits away in pieces, until a portion of the matrix at the side has been left dry and bare. Sometimes a portion only of the nail, sometimes the whole nail, is involved in this process. The nail which is finally reproduced is nearly always normal in structure and appearance.

All the forms of onychia which have been described are dry and painless. The patient usually ascribes them to an injury, but they are not infrequently symmetrical on both hands. They always get well with or without treatment, and their course is invariably very slow.

Treatment.—Internal mercurial treatment certainly modifies dry onychia favorably; but the effect of treatment is very slow, owing to the chronic nature of the process and the peculiar structures involved. I think I have seen advantage slowly follow the local use of mercurials. The five or ten per cent. oleate of mercury (Squibb) may be anointed upon the dry, rough nail at night, and the parts protected by a glove-finger. Fortunately it is uncommon for more than one nail upon a hand to be involved at the same time, and the patient usually manages to conceal the deformity until time has relieved him. I do not think that the

iodides exercise so favorable an influence upon dry onychia as the mercurials internally; but, as the affection often comes on at the end of the second year, or later, the combination of some form of iodine with the mercurial administered internally, is not inappropriate.

Paronychia due to syphilis is somewhat more common than dry onychia. A mucous patch may appear under the nail, or in the sulcul alongside of the nail, and, ulcerating, involve the matrix. Ulcerative and papulo-squamous lesions may grow up to the border of the nail, and include the matrix in a fissure or an ulcer. A papule on the fold of skin above the lunula leads to alteration in the nail. An ulcer preceded by a small, painful, livid swelling, may start at one side of the nail, and run around the border, involving the nail, and causing it to be shed by suppuration of the matrix. Such ulcers are apt to be attended by the formation of exuberant granulations at the borders of the undermined nail. The secretions are retained in such cases long enough to putrefy in part, and they become thin and offensive in odor. The whole or only a portion of the nail may come away, and the ulcer which takes its place may eat down into the matrix deeply enough to destroy it. The whole toe or finger may inflame (dactylitis), and the ungual phalanx may be involved in necrosis. When the ulcer is deep enough to involve the matrix to a considerable extent, a healthy nail is not again produced, but, after healing, which always takes place, the nail may be represented by a deformed substitute, or by uneven bands of cicatricial tissue containing varied amounts of nail-substance. A gummy tumor commencing in the matrix, (usually near the lunula), sometimes occurs, terminating in ulceration, sweeping away the nail, and threatening the whole phalanx.

The diagnosis of syphilitic onychia and paronychia is difficult. The dry onychia in its different forms is, in many cases, difficult to distinguish from similar conditions produced by eczema and psoriasis. The ulcerative form resembles ingrowing nail, but in the syphilitic disease the matrix is usually involved first, and not secondarily, as in ordinary ingrowing nail, or in common runround. The gummy tumor is not apt to be taken for anything else.

The treatment of paronychia, and of ulcerated matrix generally, is to keep the parts scrupulously clean by washing with warm water and soap, by means of a camel's hair brush; to remove all dead and raised portions of nail (often, with advantage, the whole nail), and to treat the stage of syphilis in which the malady occurs with the remedies appropriate to that stage. The best local applications for the ulcers are pure iodoform freely used, black and yellow wash, mild oleate of mercury, and the judicious use of poulticing, pressure, and nitrate of silver if the granulations are exuberant.

DACTYLITIS.—SYPHILIS OF THE FINGERS AND TOES.

This is an important form of syphilis. It falls naturally into place here, since many tissues are involved at the same time in the affection, and the malady cannot well be described under the head of any of them alone. Syphilitic dactylitis did not receive much attention until a few years since, but now enough cases have been minutely recorded to make its history a clear one. It occurs in two forms: the one involving the joint and more superficial tissues, the other the bone and joint. Both are gummatous.

The first form is a gummy infiltration of the periosteum and subcutaneous tissues. But one phalanx (generally the proximal) may be involved, or the whole finger may share in the morbid process. I am now treating a case of six months' duration, in which the disease commenced as a tuberculo-squamous eruption upon the thenar eminence. The thumb became involved in a spread of the eruption, and then suddenly all of its tissues became infiltrated in almost a painless way, until the thumb was more than twice the size of its fellow, and much crippled as to the movements of its joints. The eruption, meantime, continued upon the thumb, and remained there after the latter had been reduced by treatment very nearly to the size of the thumb of the other hand.

The swelling in this form of dactylitis is firm, ends abruptly, and does not shade off into the surrounding skin. It is not attended by pain except on motion, which is generally mechanically interfered with by the swelling. The color of the integument is often a livid, light red, whether there is any eruption upon the skin or not. If the disease is allowed to progress, the ligaments of the joint next become involved. Effusion into the joint is exceptional in this form of disease. Finally, the cartilages erode and the joint is destroyed, the bones becoming implicated at this time.

The course of the affection is slow, and relapse not uncommon. Per-

FIG. 17. Dactylitis of the toe.

sistent treatment is always curative, but, if the cartilages have been involved or the joint disintegrated, loss of function necessarily follows.

Fig. 17, after Taylor, represents a toe which is the seat of this diffuse dactylitis.

The other form of dactylitis is a gummy tumor of the bone, starting sometimes under the periosteum, sometimes in the medullary membrane. One or more phalanges may be attacked. Fig. 18, after Berg, represents the common seat of the tumor in a typical case, the proximal phalanx. Effusion may take place into a joint, and the latter may be involved in the disease even to a greater extent than the intervening phalanx. I had one such case at the Charity Hospital, in which the metacarpo-phalangeal joint of the thumb and of the great toe on the right side bore the whole brunt of the disease.

The superficial and surrounding tissues often escape implication in an extraordinary way. The skin may be of a livid pink from tension, but

not at all structurally altered; the nail generally escapes, even when the ungual phalanx is the seat of disease.

The natural evolution of this malady seems to be that it culminates after a time, and the gummy tissue, not being organized, is reabsorbed without breaking down. Very rarely does the gummy tissue disintegrate and ulcerate its way to the surface. As a result of this interstitial ab-

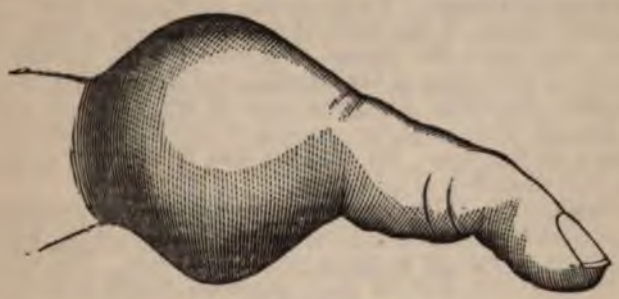

FIG. 18. Berg's finger.

sorption, the bone atrophies visibly and the phalanx shortens. When two bones and an intervening joint have been involved, the shortening due to absorption is so considerable as to reduce the whole finger greatly in length. In a case of McCready's, which he kindly showed to me and which has been pictured by Taylor [1] (Fig. 19), the deformity produced by

FIG. 19.

this absorption was very striking. There had been no ulceration reaching the surface in this case, and the functions of the fingers were comparatively good.

When the centre of a phalanx only is involved in the disease, absorption of the gummy material may leave the bone separated in its centre,

[1] Am. Journal of Dermatology and Syphilography, January, 1871.

In such a case the two ends generally come together as a false joint, and the skin over them contracts, so as to conform itself to the new order of things. There is no pain at all, as a rule, in this form of dactylitis.

The diagnosis in dactylitis is very easy. The first diffuse variety can hardly be mistaken for any other malady. Gout and all ordinary inflammations are too painful to be confounded with it. The second form might be mistaken for enchondroma, which also is painless, and apt to appear upon the phalanges. Enchondroma grows more slowly, and prefers the palmar aspect of the bone as a point of origin, while dactylitis starts more often upon the dorsum of a bone (in the periosteal form). A close study of the course of the affection will clear up the diagnosis.

Prognosis.—Syphilitic dactylitis, even if left to itself, always gets well; but it is apt to do so at the expense of deformity and more or less interference with function. Its progress may be arrested at almost any stage by a bold and efficient treatment.

Treatment.—The diffuse form requires mercury in combination with iodide of potassium or some other iodide, which (the iodide) must be unsparingly pushed as rapidly as the stomach will allow. The second form needs no mercury, but, like all pure gummata, yields generally a very ready response to the vigorous use of the iodides. They should be combined with a vegetable bitter, and given lavishly. In the way of local treatment, inunctions of mercurial ointment, or of the oleates, seems to help along, and I have thought that pressure was sometimes of service. The effect of treatment in any case is slow.

SYPHILIS OF THE MUSCLES.

Syphilis attacks the muscles by involving their connective-tissue atmosphere in congestive and hyperplastic processes, or by the formation, in this atmosphere, of gummatous deposit. The contractile function of the muscle is always interfered with while under the influence of the attack. The diffuse hyperplastic form tends to produce cirrhosis of the muscle and atrophy; the gumma destroys the part of the muscle it occupies.

There are three forms of syphilis of the muscle: the congestive, the diffuse hyperplastic, the gumma.

The congestive myositis may be, and doubtless is a mild degree of the diffuse hyperplastic form. Notta[1] first called attention to it as a peculiar affection of the biceps, and Mauriac[2] recently has collected eighteen cases (nine of them personal), out of which he constructs a new subdivision of syphilitic myositis.

The malady in question appears to involve mainly the lower end of the biceps cubiti. Other muscles also suffer—notably, the triceps in the arm. The malady comes on between the sixth and the tenth months, oftener in light than in severe syphilis, and usually in patients who have suffered from pains in the muscles and fibrous tissues previously in the disease. Mauriac observed it more often on the left side, and accompanying dry rather than moist cutaneous lesions. Usually the affection is unilateral, or, if bilateral, of unequal intensity on the two sides.

It comes on insidiously, and advances slowly. In the biceps—its

[1] Archiv. gén., 1850, p. 413.
[2] Leçons sur les myopathies syphilitiques. Paris, Delahaye, 1878, pp. 208.

muscle of election—the malady shows itself by an inability to straighten the arm completely, on account of the pain caused by the effort at the lower point of attachment of the muscle. Flexion is normal. When the triceps brachialis is simultaneously involved, the elbow becomes fixed (muscular anchylosis).

In this affection, according to Mauriac, all the tissues about the joint are normal, except the tendon of the biceps, which is short, hard, stiff, prominent. The muscular fibres appear to be semi-contracted—a condition increased by forced extension or voluntary flexion. Occasionally, there are dull pains in the muscle by night. The pain on forced extension is referred to the upper, inner part of the lower tendon of the biceps. If the triceps is also involved, there is another focus of tenderness above the olecranon. These points are generally sensitive to pressure.

Untreated, this affection continues for several months—occasionally, several years—but always gets well eventually, without altering the muscular structure. Mauriac believes the lesion to be hyperæmia.

The diffuse form of connective-tissue hyperplasia is a chronic myositis of specific nature. The parenchyma of the muscle becomes thickened by the development of new round and fusiform cells, which go on to organization into fibres, lose their succulent character, contract like cicatricial tissue (as in cirrhosis) upon the muscular elements, and, untreated, in the end lead to atrophy of the muscle, with more or less shortening and loss of function.

In this affection there is no pain, but the muscle gradually shortens, diminishes in size, and becomes more fibrous in texture. Muscles of the upper extremity (particularly the flexors) and of the face are more often involved than those of the lower extremity.

Treatment is of advantage in some cases, even after atrophy has commenced. All cases treated early are favorably influenced by a combination of mercury with the iodides.

GUMMA OF THE MUSCLE.

A gummy tumor may form in any muscle among the connective-tissue elements, or in the sheath. A gumma here is, as it is elsewhere, at first a collection of nucleated, round and spindle cells, which finally become absorbed, or remain as a mass of cheesy débris, or soften and find their way to the surface, acting just as gumma does when its seat is in the subcutaneous connective tissue.

No muscle is exempt from liability to attack, but certain large muscles, gluteus, pectoralis major, sterno-cleido-mastoid, trapezius, the heart, are most commonly the seat of the new growth, or certain delicate muscles, those of the tongue, larynx, pharynx, soft palate.

The symptoms of gumma of a muscle are at first only a tumor in the muscle, which is painless, and often of considerable size when first discovered. In a large muscle the tumor is found to be stationary, when the muscle is thrown into contraction; at other times movable (Nélaton). The skin is normal over the tumor until the latter approaches the surface and begins to soften, and then there may be complaint of some pain, especially at night.

The termination of gumma is in destruction of all the muscular fibre involved in the new growth, whether the gumma becomes cheesy, or soft-

ens and discharges. Prompt treatment alone can arrest destruction of tissue.

The symptoms of gummata of the pharynx, larynx, and tongue are detailed elsewhere.

The diagnosis of a muscular gumma is only possible, in many instances, by aid of the history and concomitant symptoms, and by the effect of treatment.

Treatment with iodides in large doses is generally promptly effective of a cure in the earlier stages of gumma. After the mass has softened, treatment is sometimes incapable of preventing perforation of the skin and discharge of the syrupy and cheesy débris.

SYPHILIS OF TENDONS, SHEATHS OF TENDONS AND APONEUROSES.

Verneuil first, and later Fournier, have described affections of the sheaths of tendons due to syphilis. The sheaths of the tendons on the back of the wrist in secondary syphilis may become the seat of effusion, swelling up in triangular form, with the base toward the fingers, or the effusion may be less generalized. The swelling fluctuates, and usually is unattended by pain. Occasionally, however (Fournier), pain, heat, redness, and interference with function, are as great as in inflammatory tenosynitis.

Other tendons about other joints may be involved in a similar process, but the affection at best is a rare one, and the back of the wrist its point of election.

Treatment is mercury internally, and it is usually promptly effective.

Tendons are sometimes involved in syphilitic diffuse interstitial connective-tissue thickening, and extensive gummata of nearly all the large tendons have been placed on record. Gummata of tendons are painless until they create irritation by their size, or by commencing to soften. When they become painful, the muscle from which they spring generally refuses to act.

The aponeuroses are subject to the same changes as the tendons.

Treatment is that of tertiary syphilis: mixed treatment for the diffused form of disease; iodides alone for gummata.

SYPHILIS OF THE BURSÆ.

Verneuil has reported an interesting observation of simple dropsy of the bursa behind the olecranon, without thickening of the walls of the bursa, and due to secondary syphilis. Verneuil and Moreau have given cases of tertiary syphilitic affections of the bursæ. I have reported[1] several cases of tertiary syphilitic bursitis, and observed a number of others since the publication of my paper upon the subject.

Tertiary syphilitic housemaid's knee is the most common apparently of all forms of syphilitic bursitis. Next in liability to attack seems to be the bursa at the inner side of the knee. The bursa behind the olecranon follows. The other bursæ are attacked on the whole very seldom. The malady is far from common in any of its forms.

Figs. 20 and 21 represent two cases of tertiary syphilitic housemaid's

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[1] *Syphilis as affecting* the Bursæ: Am. Jour. of Med. Sci., April, 1876, p. 349.

knee taken from my paper upon the subject. Fig. 20 shows the first form of the affection, that commencing from without. A deep tuberculo-squamous, perhaps ulcerative, syphilide appears first over the knee and involves the integument covering the bursa. The skin thickens, is livid, rough on the surface, perhaps ulcerated. It becomes sometimes almost elephantiasic in thickness, and shows deep lateral burrows due to the motions of the joint, but the physical characters of the eruptions and ulcers upon the surface mark the process as syphilitic.

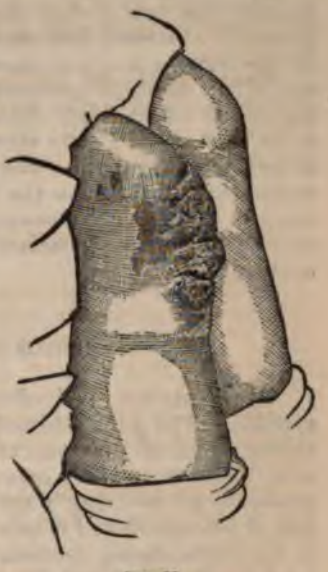

Fig. 20.

After the morbid changes have reached this height, and sometimes long before it, when there is only an eruption lying over the bursa in front of the patella, the tissues surrounding the latter become involved in the disease. The walls of the bursa sometimes thicken enormously and a gummatous infiltration invades its whole structure and grows into its cavity. The tendency of this newly formed tissue is to become soft, gelatinous, and to work its way by ulceration to the surface, where it discharges as a puriform material containing the débris of the bursa. In this way the morbid material eliminates itself, and cicatrization effects a cure, although fistula may remain leading through the skin to the site of the former bursa for a considerable period.

The second form, Fig. 21, commences from within. It is an infiltration of the bursa, with gummy material, primarily, the surrounding tissues and the skin being spared until the tumor formed by the bursa has softtened, contracted adhesions, and prepared to discharge externally. The affection comes on insidiously, is often discovered by accident, is absolutely painless until softening sets in.

Fig. 21.

The diagnosis of the first described form of syphilitic housemaid's knee is easy on account of the accompanying eruptive phenomena upon the integument over the knee. In the second form diagnosis is almost impossible except from the history. The tumor may be symmetrical, but if so, is usually uneven on the two sides; the bursa is as hard as a nut at first and throughout, until the gumma begins to break up and the skin to adhere. Only occasionally can any fluctuation be felt before this time. These features may distinguish some cases from common housemaid's knee, but certain indolent forms of the latter resemble it greatly, even in the peculiar woody hardness which the syphilitic variety always possesses in a high degree.

For the other bursæ, when implicated in syphilitic disease, concomitant symptoms, study of the case and of the history, must be depended upon to clear up the diagnosis.

The course of tertiary syphilitic bursitis is very protracted; months or years may be involved in the evolution of the disease, and a syphilitic ulcer or sinuses may persist almost indefinitely after the bursa has softened and discharged externally.

Treatment should be mixed. The iodides are more powerful in dispersing the tumor than mercurials, but the effect of treatment is not promptly observed, and the combination of mercury with the large doses of the iodides seems to increase the effect of the latter. The free local use of the oleate of mercury at five or twenty per cent. strength, according to its effect upon the skin, has certainly a positive value. Treatment is of advantage in shortening the duration of the affection in all its stages, the ulcerative as well as the others; but it is very desirable to bring treatment to bear upon the tumor before the skin has become involved, since in this manner absorption of the gumma can generally be effected, and prolonged suppuration as well as the subsequent scarring may be avoided.

SYPHILIS OF LIGAMENTS AND JOINTS.

The joints are involved occasionally, both in secondary and in tertiary syphilis. The joint affection in the former case is attended by pain, spontaneous and on pressure, and by fever, which may run to such a height as to make the malady assume the form of acute articular rheumatism, especially as sweating is apt to be a feature of the malady, with acid urine full of urates; this of course in severe cases. The pains felt so commonly in the joints during secondary syphilis are not necessarily located in the joint itself. They may be due to changes in the bursæ, in the tendons, in the periosteum about the joint. When the joints are involved in early syphilis, there is generally some effusion of fluid. The affection always gets well and yields to mercury.

The acute form may also occur, according to Duffin,[1] Bäumler,[2] late in syphilis. Its diagnosis (Duffin) is always easy, since the fever accompanying it is decidedly intermittent, with nocturnal exacerbations, and this fever as well as the rheumatism yields a quick response to antisyphilitic treatment.

A chronic hydarthrosis, due to tertiary syphilis, without any thickening of the structures forming the joint, is occasionally encountered. I have seen two such cases. Both of them yielded very promptly to the iodide of potassium.

Gummatous infiltration of the small joints, terminating in their disintegration and destruction, sometimes with opening and discharge externally, sometimes without it, has been referred to in connection with dactylitis.

The larger joints also suffer in tertiary syphilis, their ligaments, capsule, and the surrounding tissues becoming the seat of gummatous infiltration. A number of cases have been reported in which various joints have been involved.

The knee suffers far more frequently than any other joint. A gummy deposit takes place in the capsule, in a diffused form, with localized areas of greater thickening—the extra deposits being often in the loose portion

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[1] Trans. Clin. Soc. of London, Vol. II., 1869, p. 81.
[2] Ziemssen's Cyclopedia (Am. Translation), Vol. III., p. 177.

of the capsule, extending above the knee in front under the tendon of the quadriceps muscle. Together with this thickening of the capsule, there occurs slowly an inconsiderable effusion into the joint. This effusion may be absorbed and form again—a feature, according to Richet, of diagnostic value for the syphilitic form of synovitis. There is no pain early in the disease, and no fever. The joint feels weak, but motion at first is not painful, only the joint gets tired sooner than its fellow.

The malady is usually unilateral. As the changes progress, nocturnal pains often set in, the joint assumes more or less of a fusiform shape, recalling white swelling, with which it is ordinarily confounded. The knee becomes distinctly hot to the hand.

Finally the cartilages soften and disintegrate, gummatous material fills the cavity of the joint. Softening of the gumma takes place with discharge externally, or even, in the case of absorption, the joint has become disorganized, its functions forfeited, and anchylosis ensues.

The diagnosis of syphilitic arthropathy of the knee is with white swelling. In white swelling (strumous fungous arthritis) the patient is generally young, the joint becomes hot and painful early in the disease, and uniformly involved in the general oval thickening of the tissues from the first. There is not so insidious an onset as in syphilis, and no localized hard bodies in the loose capsule above the joint, in the beginning, suggestive of loose cartilages in the joint. The peculiar indolence of the syphilitic arthropathy is its chief diagnostic feature—an indolence which allows painless motion to the joint many months after all motion would have ceased had the disease been due to another cause. I have seen a number of cases of syphilitic arthropathy of the knee, among them one had been long treated as a white swelling, another as rheumatism, another was amputated, another ignored. Unfortunately, syphilis as affecting the joints is not sufficiently well known among the profession to be carefully looked for, and many cases go badly by default.

Treatment.—Mixed treatment, with the iodides in excess, yields wonderful results in this malady. Few cases are so bad that they cannot be benefited, and in almost any case where the cartilages have not been eroded, no matter for how many months the affection of the joint has lasted, a cure may be pretty confidently expected by an active treatment pushed rapidly at first, and prolonged in a milder form for a considerable period after apparent recovery. The local use of mercurial plasters and of the oleate, and the employment of pressure locally assist in the rapidity of the cure. All things considered, treatment may be expected to act with considerable promptness in these cases. After disintegration of the joint, or anchylosis, the effect of treatment can do no more than arrest the disease. It cannot cause the formation of a perfect joint.

Effusion into a joint may take place in connection with syphilitic disease of one of the bones entering into its structure, and that without any physical lesion of the joint, except hyperæmia. Such symptoms dependent upon disease of the bone yield when the latter gets well.

SYPHILIS OF THE BONES.

The bones may be involved in secondary, as well as in late syphilis. The epiphyseal changes in the long bones will be noticed under the head of inherited syphilis. Mauriac[1] has observed nodes in secondary syphilis

[1] Affections syphilitiques précoces du systeme osseux. Paris, 1872.

upon a number of different bones, and other investigators have reported a few cases. These nodes, however, are not the destructive gummata of late syphilis; indeed, rather rarely do they even go on to organization and hyperostosis, the common termination of ordinary nodes in tertiary disease. The secondary syphilitic node is often only a subperiosteal œdema and hyperæmia coming on suddenly, perhaps as the result of local injury, disappearing promptly under treatment, and leaving behind no trace of its existence.

Some few of the secondary subperiosteal swellings, however, do lead to local thickening of bone, which remains permanent.

OSTEOCOPIC PAINS

commonly occur in secondary syphilis, and often in late syphilis as well. They are pains of a splitting, boring, bone-breaking character, coming on at night in certain bones, sometimes with great regularity and terrible fierceness, and ceasing toward morning. These pains are probably due to slight periosteal swellings in secondary syphilis, attended by considerable subperiosteal hyperæmia. Ordinarily tolerable, they are sometimes excruciatingly painful in character. The warmth of the bed seems to intensify them (Ricord), and sometimes the weight of the bed-clothes cannot be borne upon a bone which is the seat of pain. Baümler thinks that it is not the heat of the bed, or the night time, which causes the pain, but a febrile exacerbation coming on toward evening, which dilates the peripheral blood-vessels. Occasionally, but very rarely, the pains come on by day, and cease by night. In such cases no thermometric observations have been made, so far as I am aware.

These osteocopic pains are often relieved somewhat by pressure. They occur about the head and neck, the shoulders, elbows, and knees, and in the continuity of the long bones. The previous use of mercury has nothing whatsoever to do with the causation of these pains, which, on the contrary, are not apt to come at all if mercury has been commenced early enough, and which disappear more quickly under the use of mercury than under the employment of any other drug.

In connection with the pains, sometimes, when the bone is superficial (cranium, tibia), the periosteum is apparently raised a little, and gives to the fingers an obscure sense of fluctuation. Often, on the other hand, in early syphilis, the osteocopic pains lie at the attachment of the tendons of muscles into the articular ends of bones.

The night headache of early syphilis is usually an intense osteocopic pain.

Treatment.—Osteocopic pains early in syphilis are favorably influenced by both mercury and the iodides, but mercury has decidedly the more power over them. When the pains are only moderate, they do not call for any deviation in the general treatment which the stage of the disease calls for in which they occur. When they are intense, however, mercury in minute doses, frequently repeated, will sometimes relieve them very promptly. This is known as Trousseau's plan of treating early syphilitic headache. It is often of value in the treatment of other intense osteocopic pains. From one-fifteenth to one-tenth of a grain of calomel may be given in this treatment hourly, for twenty-four hours. Then it is well to arrest treatment for one day, and then repeat a similar course. The object of interupting treatment is the fear of salivation or

of intestinal disturbance, of which there is some danger when this method is pushed in susceptible cases.

When osteocopic pains come on in late syphilis, they generally indicate a tendency to serious disease of bone, and call for the iodides in large doses. The mercurials are also of advantage here, but the iodides outrank them.

Of the serious lesions of bone produced by syphilis, three require description: the node, dry caries, and the gummy tumor.

THE NODE.

A node is an inflammatory osteo-periostitis, terminating generally in new formation of bone. The subperiosteal tissues first become congested, then there is a new formation of soft, round, and spindle cells. By this proliferative cell-formation, the periosteum is raised over a variable area in the form of a rounded lump, which gradually shades off into the surrounding tissues. This lump is soft, and at first quite painful, especially upon pressure. Manipulation proves it to be attached to the bone. The skin over it is freely movable, and not discolored. There is often œdema, especially in young nodes of large size. The pain in these nodes is sometimes considerable, spontaneously, especially if they are situated on the shin, and if the patient walks or stands much. The pain is quite certain to be intensified at night.

The bones most often involved are the flat bones (cranium) and superficial bones (tibia, clavicle, ulna). Local injury, a blow, will sometimes cause a node to appear, but neither situation nor local violence is necessary for their production, for they sometimes grow from the inner table of the skull, where they cause great damage by pressure, and they are occasionally found upon a deep-seated bone (femur, vertebral column) well down among the muscles.

The date of appearance of nodes is late in syphilis. Early forms do occur, as already mentioned; but they are not important, and generally disperse, leaving no trace.

The course of a node is generally slow. After remaining soft for a varying period, they become firmer, and gradually disappear by absorption under treatment or (sometimes) spontaneously, leaving no trace behind, or only a depression surrounded by a hard border of new bone, which has formed at the circumference, while no bone-salts have been deposited centrally. Occasionally a node softens centrally, the skin over it becomes involved, red, adherent. The softened node discharges and a syphilitic ulcer remains, the floor of which is bone denuded of its periosteum. This bone becomes black or brown where it is exposed, and often a superficial flake necroses, separates in due time, and comes away, after which the ulcer heals. On the skull the outer table comes away generally, the inner table remaining, perhaps perforated by a number of holes through which the dura mater may be seen and felt.

Sometimes a node will remain as a hard, fibrous lump, perfectly painless, and as solid as wood for a number of years, causing no inconvenience. In such a lump bone-salts are not deposited; the mass consists of spindle cells, round cells, and connective tissue. Such a node, after existing for years, may suddenly soften and melt away, involving the bone in destruction, large portions of the superficies of which necrose in the floor of the ulcer. I have seen one such case where a fibrous syphilitic node, as large

as an egg, remained stationary for eleven years upon a man's skull, and finally softened after a severe attack of typhoid fever, and caused the loss of a number of square inches of the outer table of the skull.

The scars left by nodes which have softened and discharged are white, puckered, attached to the bone, often pigmented at the circumference. The loss of bone by necrosis is not made up, but the old bone at the edges of the ulcer may be thickened.

Finally and most commonly, a node, having existed some time, undergoes partial transformation into true bone in its under layers and circumferential portions. Such new formations of bone cannot be removed by treatment. They remain permanent; but after a time they lose their sensitiveness and constitute simple exostoses.

Besides periostitis there may be a general proliferative osteitis (usually of a long bone) involving a portion or the whole of a bone in a painful general thickening. The increase in size remains permanent.

The form of bony outgrowth due to syphilis has been called epiphysary exostosis. It is an irregularly shaped ridge or prominent pedunculated bony formation occurring about the epiphysary ends of long bones, recalling the outgrowths seen in rheumatic gout.

Diagnosis of nodes is not difficult. When young and soft they may possibly be mistaken for œdema or abscesses; but the course of the growth, and particularly the nocturnal pains, suggest a search for a syphilitic history, and put the physician on the right track to discover the nature of the affection.

Treatment.—Nodes respond very readily to treatment, as a rule. The iodides are called for in doses large enough to control nocturnal pain. They should be kept up for several weeks or months, after an apparent disappearance of the node or relapse is to be feared. The length of this after-treatment depends upon the age of the node.

DRY CARIES.

Virchow has described this affection after profound study of the pathological process. The frontal and parietal bones of the skull are most often involved; indeed, the affection is almost confined to the cranium, the external table alone, or both tables of the bone being implicated. The outer coat of the blood-vessels perforating the bone is the matrix in which the new growth of cells takes place in caries sicca, as shown by Rindfleisch and Virchow. This new cell-formation is gummatous. Its development by pressure causes an atrophy of the bone surrounding the vessel, while at the outer edge of the little collection of cells the subperiosteal cell formation lifts the periosteum, and therefore does not cause enough pressure to produce atrophy. This circumferential portion of the little tumor, therefore, becoming ossified, creates a raised ridge, while ultimately that portion of the minute gumma which occupied the adventitia of the vessel is removed by absorption, and leaves a cavity produced by the previous atrophy of bone. The periosteum sinks into this cavity and adheres to its floor. The bone surrounding such a minute depression in the skull and the diploë about it become sclerosed.

The skull sometimes is perforated by caries sicca. More often upon the inner table localized thickenings of bone are found and bony osteophytes, with, not unfrequently, fibrous thickening of the adherent dura mater.

Occasionally, caseous yellow deposits have been found at these spots attaching the pia to the dura mater.

The final scar in the bone is a stellate, puckered depression, with an eburnated, raised border.

Symptoms.—Caries sicca comes on only in late syphilis, and announces itself by localized pain without swelling. In the atrophic stage the worm-eaten depressions in the skull may be readily felt through the scalp. They are pathognomonic of syphilis and by themselves are sufficient to establish a diagnosis. Without them the history must be relied upon in the main for diagnosis.

Treatment is that of gumma of bone.

GUMMA OF BONE.

A gummy tumor late in syphilis may form anywhere in a bone—under the periosteum, in the medullary membrane, interstitially as in caries sicca.

The subperiosteal gumma is found chiefly upon the clavicle, skull, sternum, ribs, tibia, ulna. It commences like a node, and indeed a node is a gumma, but the true gummy tumor forms more rapidly, is less diffuse, and tends always to soften, while the less active node tends naturally to remain organized. The gumma is an acute process, like the osteitis and periostitis already described, but much more active. Consequently, it is more serious, more destructive.

The gumma, commencing like a node and advancing rapidly, softens, attaches itself to the skin and discharges, its puriform débris remaining as an ulcer with dead bone at the bottom. The pain in superficial gumma of bone is generally slight, or absent entirely. Instead of discharging, gumma of bone may remain a soft mass for a time, finally becoming cheesy; and even a softened gumma, instead of discharging, may calcify.

Gumma of the medullary membrane in the long bones is uncommon. It is usually attended by intense pain, worse at night; the whole bone swells, and finally gives way. Ultimate atrophy of the portion of bone involved is to be expected.

Medullary gumma of the short bones is not very uncommon. A type of such formations is seen in dactylitis, already described at p. 175.

The diffuse thickening of bone, already referred to in connection with syphilitic osteo-periostitis, is often a gummatous process, the connective tissue around the vessels permeating the bone, in the Haversian canals and canalicules, being the matrix in which gelatinous, gummatous hyperplasia occurs, afterward drying up and being absorbed, leaving the enlarged bone very porous, or remaining degenerated in the form of yellow or cheesy deposits.

In the flat bones, and particularly in the diploë of the skull-cap, syphilitic gumma takes the form of an infiltration, widening the bony lacunæ, cutting off the vitality of the thin plates of bone involved, and, by its gradual increase, separating the two plates of condensed bone from each other. Finally, a piece of condensed bone may die, and gradually exfoliate. The external table of the skull over a considerable area may perish in this way, and, when the necrosed portion has exfoliated, its under surface is found to be very much worm-eaten and roughened. This is due to the nature of the morbid process which effects the separation. At the circumference of these morbid processes, as elsewhere in bone syphilis,

eburnation, condensation, and thickening of bone take place with more or less tendency to osteophytic and hyperosteal formations. Sometimes the inner table of the skull necroses in connection with diffuse gumma of the diploë, leading to changes in the dura mater and brain, and to the most serious nervous symptoms.

When the very thin bones are attacked by gummatous changes they ulcerate and in part necrose, portions of dead bone coming away entire. This is the rule in the case of the thin bones of the nose, palate, etc.

The disease of bones in these regions, indeed, is often only a complication of gummatous ulcers commencing in the soft parts, which, during their progress, have involved the bone. The same result sometimes complicates gummatous ulcers of the integument, as already detailed (p. 162); but the bones of the nose are peculiarly liable to destruction from syphilitic processes, a fact well known among the laity, who look upon every destructive disease of the nose as an evidence of syphilis, and generally expect that any one with syphilis stands in hourly danger of losing his nose—assumptions as false as they are general.

As secondary results of the changes in bone produced by syphilis, may be mentioned a fragility of the porous bone, rendering its fracture very easy, and its repair slow and imperfect. Damage may also be caused through pressure, by hyperostoses, upon soft parts, cranial nerves, spinal nerves, the eye in orbital exostosis.

MERCURY AS A CAUSE OF BONE DISEASE.

Finally, it is necessary to emphasize the fact that mercury has nothing to do with disease of the bone. The cry with many in the profession and nearly all among the people is, mercury destroys the bones. Very intelligent men coolly sit down and state that they are unwilling to take mercury for their symptoms, for fear that their bones will become diseased; and medical men keep up the terrorism of the people by attempting to cure syphilis without mercury. No statement is more unfounded in fact than that the syphilitic bone symptoms of syphilis are caused by mercury. The node of the skull, mentioned at p. 185, which softened after typhoid fever, and swept away the outer table of half a parietal bone, occurred in the person of a physician in the country who was afraid of mercury, and never had taken it for his disease. Nodes and bone disease occur in all forms of practice. Patients treated without mercury frequently suffer very seriously from bone syphilis. Patients in Norway, who have been "syphilized" and taken no medicine for their disease at all, certainly suffer from bone syphilis, as Boeck himself has remarked to me; and finally—most convincing proof—the bone lesions of inherited syphilis are so common as to be almost uniform in their occurrence, in greater or less intensity, and surely the unborn babe has had little chance of exposure to the supposed noxious influence of mercury.

Mercury given in excess to the point of salivation may, and certainly does, threaten the maxillary bones, especially the alveolar process, with destruction; but aside from this, mercury does not cause any symptoms which might be, and usually are, produced by the poison of syphilis.

The researches of Kussmaul[1] concerning the influence of mercury upon workers in the metal, settle this question from one standpoint, while hon-

[1] Untersuch. über d. constit. Mercurialismus. Würzburg, 1861.

est clinical observation settles it with equal force from another. The traditions of the people, and the ignorance of some and quackishness of others in the profession, are responsible for the continuance of this error. Mercury given in a proper manner does no ultimate harm to the individual, and sometimes bone symptoms will get well more promptly under mercury than under the iodides.

Treatment.—As a rule, all forms of bone disease, from the painful spot to the gumma, respond to the iodides. Mercury is also beneficial, especially in osteocopic pains and all lesions occurring early in the disease; but in the true gumma, and in the node of tertiary syphilis, mercury can generally be dispensed with, and full reliance placed upon large doses of the different iodides. Sometimes, when the iodides fail, or after a time cease to act, mercury becomes efficient in removing the morbid process, even when it is gummatous; but mercury certainly holds the second place in most cases.

SYPHILIS OF CARTILAGE.

Cartilage of incrustation does not suffer immediately from syphilis. When a joint is involved, or syphilis attacks the expanded end of a bone capped by cartilage, the latter naturally softens, becomes eroded, and is destroyed by the neighboring disease. Of the other cartilages, the fibro-cartilage of the ear is often invaded by an ulcerative, tubercular syphilide starting in the superficial tissues. The laryngeal cartilages are a very common seat of syphilitic perichondritis, occasionally gummatous deposits involve their vitality, and portions of the cartilage may fall into necrosis, just as a bone does under similar circumstances. The trachea may be implicated in the same manner. Gummata upon the costal cartilages act like the same lesions on bone. The inter-vertebral fibro-cartilages are rarely ever attacked, but sometimes they, as well as the bones of the vertebral column, are involved in gummatous processes.

CHAPTER XI.

SYPHILIS OF THE RESPIRATORY SYSTEM.

THE DIGESTIVE TRACT, ABDOMINAL GLANDULAR ORGANS, AND THE VASCULAR SYSTEM.

Syphilis of the Nose.—Syphilis of the Larynx; non-Ulcerative—Ulcerative.—Syphilis of the Trachea, Bronchi, and Lungs.—Syphilis of the Digestive Tract.—Gumma of the Tongue.—Syphilis of the Œsophagus.—Syphilis of the Stomach and Intestines.—Syphilitic Stricture of the Rectum.—Syphilis of the Peritonæum.—Syphilis of the Pancreas.—Syphilis of the Liver.—Diffuse and Circumscribed Hepatitis.—Gumma of the Liver; Amyloid Degeneration.—Syphilis of the Spleen.—Syphilis of the Thymus, of the Supra-renal Capsules, and the Abdominal Glands.—Syphilis of the Heart.—Syphilis of the Arteries, Veins, and Capillaries.

In the nose, in early syphilis, erythematous lesions and mucous patches are apt to occur. Their symptoms are those of catarrh, with more or less discharge, some scabbing within the nose and ulceration, more or less redness, with thickening and fissuring at the orifice of the nose. Young people suffer more than adults from nasal symptoms, and babies with inherited disease most of all. The mucous patch and the erythematous lesions have the same physical characteristics here as they have in the throat (p. 166).

In tertiary syphilis, gummatous ulcers upon the mucous membranes of the nose involve its cartilages below and its thin bones above in destruction; and gummy tumors, originating either subcutaneously or within the cavity of the nose, are quite certain to destroy the bridge and large portions of the internal bony skeleton of the nose, unless arrested by treatment. After cure in these cases, the bridge of the nose is permanently sunken, and its point turned up, giving a physiognomy which is almost pathognomonic of late syphilis.

While the destructive process involving the bone is going on within the nose, the patient has what is called syphilitic ozena. This is a catarrh more or less purulent in character, the pus being usually mixed with blood. Often blood-scabs may be blown from the nose, or drawn down into the pharynx through the posterior nares. The odor of the breath in these cases is peculiarly offensive. On examining the inside of the nose, while the process is going on, yellow and black dry scabs are found closely adhering to ragged edges of ulcers, or to perforations through the septum or elsewhere. Sometimes there is considerable pain complained of in these cases, especially at night; often there is little or none. Thin pieces of bone are frequently discharged through the nostrils, and the malady is often kept up long after the dead pieces of bone have separated, on account of the fact that these sequestra, being partly enclosed in new bone, cannot escape and remain like splinters in a fester to keep up the local irritation.

In connection with the inflammatory changes accompanying gummatous

disease within the nasal cavity, the nasal duct often gets shut up, leading to abscess of the lachrymal sac, conjunctivitis, necrosis of lachrymal bone. Again, the Eustachian tube may be closed, and inflammatory trouble in the middle ear be set up, leading to deafness.

If the disease is situated high up in the nasal cavity, the olfactory sense may be destroyed or temporarily impaired.

The diagnosis of the lesions above described rests upon their course and obvious clinical characters. No other disease behaves in like manner. There is, however, one condition which may be readily mistaken for syphilis in the nose, namely, a round perforation of the cartilaginous septum, low down, generally about the size of a lead-pencil. I have encountered this several times as a result of catarrh (apparently) in patients who undoubtedly were not syphilitic. I have known a patient to possess this deformity and to be ignorant of it, and have seen it diagnosticated as syphilitic, much to the patient's distress of mind. The borders of this round hole cicatrize, and it causes no discomfort. I have seen the hole a number of times, but never during its forming stage.

The treatment of tertiary lesions of the nasal cavity is by the iodides in large doses. Local treatment is unreliable, and generally unnecessary, until it becomes evident, by the use of the probe, that there is a loose piece of dead bone ready to come away, but detained by surrounding healthy tissues. For the removal of these, I know of nothing so serviceable as the dental burr upon one of White's dental engines. I have seen this instrument used with great success in these cases, by Dr. Goodwillie, of this city.

SYPHILIS OF THE LARYNX.

The mucous membrane of the larynx suffers from erythema and mucous patches in early syphilis. The latter have been repeatedly seen in the larynx by aid of the laryngoscope. These lesions are the same here as elsewhere on the mucous membranes (as already described). They are the better for local treatment, but get well without it. Mercurial inhalations sometimes hasten their disappearance. They leave no scars behind.

The syphilitic laryngitis which interests the practitioner is the tertiary variety. It occurs in a constructive and in a destructive form in the cartilages of the larynx, and as tertiary gummatous ulcerations upon the mucous membrane, the vocal cords, and in the muscles of the larynx.

Non-ulcerative laryngitis, due to syphilis, is a chronic, constructive, connective-tissue hyperplasia, involving the cords as well as all the tissues within the larynx. The newly-formed material contracts here as elsewhere, binds, and draws together the tissues within the larynx, stiffens the vocal cords into unyielding rigidity in the closed state, and, finally, may obstruct respiration entirely, no previous ulceration having occurred. The cartilages do not become necrotic in this affection, and there is no loss of tissue, except of muscular tissue, by atrophy from pressure.

The symptoms of this affection are a hoarseness, lasting for months, even years, slight pain on pressure over the larynx, gradually increasing dyspnœa, the voice finally being reduced to a whisper, the patient becoming enfeebled, cyanotic, emaciated, gasping, praying for death to relieve him from his distress. The laryngoscope finds the larynx stenosed, the mucous membrane livid, the intra-laryngeal tissues thickened, but shows no ulceration and no cicatrices. Rapid œdema of the glottis is

liable to come on at any time in this affection, and quickly to strangulate the patient.

The diagnosis is with chronic laryngitis—a malady which is always tubercular or pseudo-tubercular, when not syphilitic. In the former case there is generally consolidation at the apex of the lung, and the laryngoscope generally detects surface ulceration in the larynx. Papilloma of the vocal cords gives all the symptoms of syphilitic laryngitis. Diagnosis with the laryngoscope is easy—without it, next to impossible.

Treatment is mixed—mercury with the iodides. It must be long continued. If commenced early, it is promptly curative; later, it is slower in its action, and less effective. In the stage of stenosis, tracheotomy is sometimes necessary, to avoid impending suffocation. In such a case, a permanent tube must be worn until treatment makes it safe for the patient again to breathe through his larynx. I have tracheotomized a patient on one occasion, in this condition, who was cyanotic, and in the last stages of suffocation. Two silver tubes were worn out in as many years; but, under treatment, the patient finally recovered entirely, and dispensed with the tube.

Tertiary ulcerative laryngitis may accompany the affection last described, or occur independently of it.

The ulcers are like tertiary, gummy ulcers of the pharynx, already described, and may occur anywhere within the larynx, on the cords, behind the epiglottis, running down in connection with ulcers in the throat, or occurring independently.

The ulcers may start as in the pharynx, upon the surface and eat in, or a gumma may form beneath the perichondrium of a larnygeal cartilage and eat out; in either case, especially the latter, a portion of the cartilage is liable to be involved in necrotic changes and to exfoliate. A gumma of the larynx may work its way out externally, giving rise to fistula.

The ulcers, surrounded by considerable œdema, are visible with the laryngoscope. The final cicatrization after cure in these cases may lead to the most extensive distortion of the laryngeal cavity, or even to its obliteration.

The symptoms are those of chronic laryngitis intensified. Pain is common, with expectoration of pus, mixed perhaps with blood and portions of sloughy tissue.

Diagnosis.—The symptoms easily localize the disease, and the diagnosis lies with ulcerative tubercular laryngitis and destructive cancerous laryngitis. In the former affection the lungs will almost always be found to be in an advanced state of tubercular disease, and in the latter, the non-ulcerated masses of new growth can often be seen with the aid of a laryngoscope.

Treatment is with the iodide of potassium in large doses—very large doses, run up as rapidly as the stomach will take it—for an imporant organ is threatened. The effect of treatment is often brilliant. Tracheotomy may be called for on account of impending suffocation from œdema. Cicatricial changes are not favorably affected by treatment, and may be so seriously obstructive to respiration as to demand tracheotomy and a permanent tube.

SYPHILIS OF THE TRACHEA, BRONCHI, AND LUNGS.

The trachea and larger bronchial tubes are subject to the same morbid conditions as the larynx, but less commonly so. Ulcerative changes

in the trachea occur by preference low down near the bifurcation. Ulcers on the surface may eat through the trachea into surrounding structures, the aorta[1] or pulmonary artery,[2] but such accidents are exceptionally uncommon.

The symptoms of tracheal syphilis are uneasiness or pain behind the sternum, cough, more or less râles, expectoration, blood, etc., tickling in the throat.

The diagnosis is with tubercular troubles, and rests mainly upon the history and concomitant symptoms.

The treatment is like that for similar conditions in the larynx.

The lungs are affected by syphilis in two ways: in the form of diffuse connective-tissue hyperplasia, leading to consolidation by interstitial changes in the parenchyma; and in the form of gummy tumor.

Syphilitic pulmonary fibrosis is very common in inherited disease. It is often generalized in both lungs in the infant. In the adult it is more commonly circumscribed. The change in either case is an interstitial thickening of the connective tissue between the air-cells, which may go on to a total obliteration of the latter in the fibroid transformation of the new cells, and cirrhotic shrinkage of the morbid tissue.

The portions of lung involved in the disease are stiff, non-crepitant upon pressure, solid, depressed below the level of the surrounding lung. They cut like fibrous tissue; the section is seen to be interspersed with yellow points; and the bronchial tubes, variously dilated and contracted, are found with thickened yellowish walls. The pleura over these spots is apt to be involved in the thickening.

In the child, when the whole lung is diseased, it is found dense and marbled on the surface, bearing the imprint of the ribs. The solid, almost fibrous tissue (white hepatization of Virchow), sinks in water, and the lung, although perhaps partly inflated in some portion less diseased than the rest, is manifestly unfit for respiratory purposes. The bronchial glands are usually enlarged and hard, sometimes with central cheesy degeneration.

The symptoms of pulmonary fibrosis are not pathognomonic. They have been the subject of much dispute, which cannot be reproduced here. In the infant the changes take place in intra-uterime life, and there are no symptoms after birth except dulness on percussion, shortness of breath and cyanosis, if, indeed, the infant has enough lung-tissue left in a distensible condition to support life for a little while. In the adult, however, the symptoms are identical with those of chronic phthisis. Any portion of the lung, apex or base, may be involved, and there are usually the accompaniments of fever, short breath, cough, emaciation, night-sweats, etc.

The diagnosis in the adult is with ordinary phthisis. The history is of great service here, because syphilitic fibrosis is often very dry and the breathing in it harsh, tubular—especially the inspiratory sounds. There may be little or no fine crepitation, perhaps no râles at all. In regard to dyspnœa, hæmoptysis, and the character and quantity of the sputa, there is no agreement among authors. My own experience leads me to believe that these signs vary in different cases greatly. I have seen hæmoptysis with profuse expectoration and little dyspnœa, in a case which got well under antisyphilitic treatment; and the opposite state of

[1] Wilks: Trans. London Path. Soc. XVI., p. 52.
[2] Kelly: Ibid. XVIII., p. 45.

great dyspnœa, with dry cough and no blood, is certainly common. The possibility of the origin of ordinary phthisis from the irritation in the air-cells and fine tubes, produced by their getting filled up with secretions, which are discharged from diseased syphilitic conditions of the larynx and trachea, must be borne in mind.

The truth is that diagnosis always rests mainly on the history, and treatment is consequently for the most part tentatively experimental.

Treatment is mixed with large doses of the iodides. Mercury, in mild courses long continued, is of very great value. Entire and permanent cures are possible in this disease, when occurring in the adult.

Gummata in the lungs may coincide with fibrosis, or come on independently. They necessarily go on to destruction of the tissues they implicate. They are rare in adult life, as well as in inherited disease.

The gumma is the same here as elsewhere: at first a tumor formed of gray succulent cells, then getting yellowish white, more or less fibrous, surrounded by a wall of condensed connective tissue; finally, being absorbed, leaving a depressed, fibrous cicatrix, or remaining in a state of cheesy degeneration, or softening, breaking down, becoming puriform, and discharging its débris by the nearest route to a free surface, through the assistance of the ulcerative process. When these tumors form near the surface of the lung, the pleura over it becomes thickened and adherent to the costal pleura.

There are no fixed symptoms for gumma of the lung. The tumor is solid at first, and may be made out by percussion, if it is large enough. It may suppurate, and, discharging into a bronchus, leave a cavity which may be revealed by physical signs. A syphilitic history does the rest to establish a diagnosis. There is no pain, and the subjective symptoms are not at all distinctive. General health may be fair, or cachexia pronounced.

Treatment is rapidly effective of relief, which is permanent so far as the tumor itself is concerned. The iodides in large doses are all that is required, with such attentions to the stomach as shall insure their assimilation.

SYPHILIS OF THE DIGESTIVE TRACT.

The secondary and tertiary lesions of the buccal cavity and pharynx have been already studied in connection with the cutaneous manifestations of the same periods (Chapter IX.).

GUMMY TUMOR OF THE TONGUE.

Gummatous lesions of the tongue are especially important and worthy of study, because they frequently come on long after all evidences of syphilis have disappeared, and are so suggestive of epithelioma of the tongue as to require oftentimes much care to arrive at a differential diagnosis.

A gumma may commence in any portion of the tongue except its under surface, and may be encountered at any time of life. Not very unfrequently it is bilateral, or there may be multiple foci of gummatous deposit. The gumma commences without any pain, as a lump deep among the muscles of the tongue, or under the mucous membrane; never superficially at first, like an epithelioma. The lump grows, the mucous membrane over it becomes stretched and livid, finally the tumor softens

centrally, ulcerates its way through the mucous membrane, and remains open as a gummatous ulcer, with a deep, sloughy cavity, hard base, fissured, ragged, thick, abrupt borders, often undermined at first, but always bound down and adherent later on. The ulcer progresses slowly. The course of the affection in any case is much protracted, but the tendency is to ultimate self-limitation, even without treatment, if the general health be good; and to cicatrization, with more or less loss of tissue, according to the extent and duration of the ulcer.

The discharge is slight, even when the ulcer is at its height; but there is considerable dribbling away of saliva. Pain is absent or inconsiderable, and the functions of the tongue not much disturbed. The lymphatic glands escape implication, or are involved only in an inflammatory way. The general health may be very little disturbed, or there may be marked cachexia.

The diagnosis is with epithelioma of the tongue, and with tubercular ulceration. The latter is very little known. Portal, Trélat, Féréol, have recorded cases. Dr. Van Buren related to me the description of a case which he saw at the Hague, in the summer of 1876, and Millard, in the Lancet of May 25, 1878 (from L'Union médicale), details a case in which there were about a hundred separate ulcers. These tubercular ulcers commence as white excoriations without antecedent tumor. The excoriations enlarge and deepen. Gelade is referred to as speaking of a case where the superior maxilla became invaded and carious.

These tubercular ulcers advance slowly and are very obstinate and hard to heal. Excision of the tongue has been performed several times on account of them, and the wound has healed kindly. Nearly always the lungs contain cavities.

The differential diagnosis between epithelioma and gumma of the tongue can be best presented in tabular form. I have abbreviated a table from Fournier, and modified it as follows:

Diagnostic Table.

ULCERATED EPITHELIOMA OF THE TONGUE.	ULCERATED GUMMA OF THE TONGUE.
1. Occurs generally late in life.	1. Occurs at any age.
2. Possible cancerous antecedents.	2. Syphilitic history.
3. The ulcer sometimes occupies the seat of former icthyosis of the tongue.	3. Nothing of the sort.
4. Commences superficially and ulcerates.	4. Commences deep in the tissues, feeling like a bullet beneath the mucous membrane. It softens centrally, and on reaching the surface, discloses a deep ulcer.
5. Lesion is unique.	5. Sometimes multiple and bilateral.
6. Occurs on any part of the tongue.	6. Found only on the back and sides of the tongue, never beneath.
7. Edges everted, tuberculated, irregular, bleeding easily when touched, or spontaneously.	7. Edges abrupt, uneven, hard, adherent, covered with slough, not tuberculated, not bleeding easily.
8. Discharge free, ichorous, putrid.	8. Discharge slight.
9. Pain spontaneous, shooting toward ear (Fournier).	9. Ulcer usually painless.
10. Tongue rigid, painful, functionating badly.	10. Functional troubles generally slight.
11. Microscopic characters those of epithelioma.	11. Microscopic characters those of a degenerating gumma.

ULCERATED EPITHELIOMA OF THE TONGUE.	ULCERATED GUMMA OF THE TONGUE.
12. Lymphatic glands become involved.	12. Lymphatic glands generally remain exempt.
13. Antisyphilitic treatment of no value, possibly harmful.	13. Antisyphilitic treatment generally promptly beneficial.
14. Termination: death by cachexia and inanition.	14. Death does not occur from this cause alone. Spontaneous cure without medicine possible.
15. Returns if cut out.	15. Does not return if cut out entirely.

Treatment.—Gumma of the tongue usually yields a rapid response to iodide of potassium in large doses, if the remedy is given before the tumor has softened. After ulceration, the effect of treatment is less rapidly brilliant, but, nevertheless, is generally quite prompt. In cachectic conditions, and when the stomach will not bear the iodides, the result of treatment is slow and often unsatisfactory.

SYPHILIS OF THE ŒSOPHAGUS.

Ulcers from the pharynx occasionally extend into the œsophagus, but gummatous deposits may originate in the œsophageal walls.

These lesions are very rare. Their symptoms are pain on swallowing, with evidence of some obstruction in the canal. When the ulcers get well, the resulting cicatrices cause stricture, which requires treatment by dilatation, œsophagotomy, or gastrotomy.[1]

SYPHILIS OF THE STOMACH AND INTESTINES.

Early in syphilis, especially during the fever, nausea, indigestion, and other functional troubles of the stomach, are not uncommon. Presumably there is erythema; possibly there are mucous patches in this stage.

Thickening and ulceration of the stomach have been ascribed to tertiary syphilis, but have not been clearly defined.

Late in syphilis, with the cachexia there often occurs a diarrhœa characterized by great prostration, and by the obstinacy with which it resists medication. Sometimes black stools of partly digested blood will be voided, or clots, or even bright blood will be passed in variable amounts. With this there may be more or less nausea, vomiting, inappetence, attacks of temporary fever, with circumscribed areas of pain due to localized peritonitis over the site of an ulcer in the intestines.

This diarrhœa, and all of these symptoms are due to gummy ulcers of the intestines. Such ulcers may be single, or multiple, and may occur in the small or the large intestines. They have been reported by a number of observers, Meschede, Oser, Wagner, Lancereaux, and others; but their occurrence is uncommon, and opportunities of observing them after death quite rare. Meschede found pigmented ulcers, Oser infiltration of Peyer's patches, with central ulceration. Klebs[2] quotes a case from Virchow's

[1] But little is known of syphilis of the œsophagus. Consult Knott: Pathology of the Œsophagus, p. 156 et seq., containing West's excellent cases from the Dublin Quarterly. Dublin, 1878.

[2] *Path. Anat.*, 2 Lief., S. 261 et seq.

Archives, where fifty-four ulcers were found in the small intestine of a syphilitic man of 36, and some circular stellate scars on pigmented bases, with tough fibrous nodules on the corresponding peritoneal surfaces. Klebs refers also to two cases of gummy submucous growth in new-born children, and has a personal case of numerous intestinal ulcers, with thickening of the peritoneal surface, in a man dying with acute symptoms.

In a personal case, which I watched with Dr. Van Buren during a number of months, in which the patient had much cachexia and prolonged attacks of diarrhœa, often voiding black stools looking like partly digested blood, death finally came about suddenly from the giving way of one of the ulcers of the ileum into the peritoneal cavity. Shock terminated life, attended by profuse black vomit. A large amount of blood was found in the peritoneal cavity, intestines, and stomach. A circular ulcer, as large as a penny, had given way, having cut cleanly through the peritoneum.

A number of scars of other ulcers were found, round and oval, the intestine being somewhat constricted where they had occurred. The muscular coat had been involved, but not eaten through. The peritoneum under these ulcers was not thickened, the scars themselves were round, smooth, flat, not puckered, not pigmented. This patient had also had an ano-rectal syphiloma, diagnosticated during life; the autopsy showed that this affection had been practically cured, although traces of cicatricial change were visible upon the mucous membrane.

Peyer's patches have been found in a state of characteristic syphilitic fibrosis by Förster in inherited disease, and other observers have found ulcers and fibroid changes in the small intestine in inherited syphilis.

Syphilis of the large intestine has been the object of much study, especially in the rectum. In the colon, syphilitic ulcers may occasionally occur; and, when these are situated near the origin of the rectum, dysenteric symptoms are the result—a dysentery which sometimes yields to antisyphilitic treatment. The contest between those claiming that the so-called syphilitic stricture of the rectum—so common in women, so very rare in the male—is always the result of chancroid, and the advocates of a true syphilitic stricture in this region, is practically ended. The unbiased student must now admit that syphilis as well as chancroid does cause rectal stricture, but in a different way. Chancroid in the female is generally due to the accidental poisoning of an abrasion at the anus by the discharges from a vagina already the seat of chancroid, which discharges run from the posterior vaginal fourchette over the anus, as the patient lies upon her back. Such an ulcer extends up the anus, lasts a long time, and, finally, leads to stricture, which is in the main cicatricial.

Syphilitic stricture is not at all analogous to chancroidal stricture in its method of formation. Fournier calls it ano-rectal syphiloma. It is due to an infiltration of the submucous connective tissue of the rectum and that lying between the muscular elements, and is dependent on active cell-proliferation. The lesion is slow in forming, and without surface ulceration. Eventually, here as elsewhere, this tissue becomes fibrous in character and contracts, producing a dense fibroid stricture without previous ulceration of the walls of the gut. Ulceration of the mucous membrane may occur in connection with the infiltration of the wall of the intestine, but this is not an essential part of the malady.

The best clinical account of this affection is given by Fournier.[1] The

[1] Syphilôme ano-rectal. Paris, 1875, pp. 73.

infiltration comes on insidiously with some loss of power in the sphincter, a discharge of mucus, and occasionally a little blood at stool. This is followed later by difficulty of defecation, small stools, constant mucous discharge, and all the symptoms of stricture.

Examination shows a series of livid, flat, semi-elastic, non-ulcerated infiltrations extending from the outside within the cavity of the rectum and up the gut. There may be outside, besides these livid infiltrations, flat or pedunculated condylomata, and perhaps ulcerated mucous patches. Occasionally an ulcer extends into the anus, but this is rare.

The finger passed through the sphincter recognizes that this muscle has lost a good deal of its contractile power, from infiltration of its substance with the syphilomatous material. Farther up the gut the surface is found velvety, of livid color, excoriated, and often the seat of punctate congestion. The mucous membrane seems itself soft, but to be bound down upon a very hard, semi-elastic, thickened, underlying tissue, which is rather indistensible, and the walls of the gut often feel as if they were the seat of infiltrations in the shape of broad, hard, linear bands, running parallel to the long axis of the gut and not around it, as in ordinary fibrous stricture.

The tightest part of the stricture is apt to be above, at the top of the new formation. The last phalanx of the index finger can generally be introduced through it, but I have seen it situated as high as four inches from the anus. There may or may not be surface ulceration at the top of the stricture and above it. After syphiloma of the rectum has lasted several years it becomes fibrous and unyielding, often very tight.

Trélat[1] thinks that the formation of dry fistulæ below the point of actual stricture, cicatrizing shortly after they form and extending from just without to just within the anus, are pathognomonic of syphiloma of the rectum. I have only seen this once among perhaps ten cases of the affection which I have examined.

Besides the ano-rectal syphiloma in the rectum, syphilitic ulcers may exist, due to the ulceration of mucous patches at the anus, and such ulcers may destroy considerable tissue and lead to permanent stricture by cicatrization. True gummy tumor of the rectum has also been observed. Zeissl has reported such a case.

The diagnosis of troubles of the rectum due to syphilis is very difficult. Great differences of opinion still exist in the profession as to the possibility of pure syphilitic stricture of the rectum. The stricture of the rectum found in women after difficult labor in early life seems much to resemble the ano-rectal syphiloma, excepting that in the former the flat, livid infiltrations around the anus do not exist. When ulceration has preceded stricture, it is difficult to differentiate the chancroidal form from that occasioned by ulcerated mucous patches.

The true ano-rectal syphiloma, however, is easily recognized. No other malady produces the livid, flat, softish, semi-elastic external patches extending into the sphincter and weakening its power, attended by the denser infiltration higher up, with little or no surface ulceration and comparatively little pain.

Treatment.—In all the tertiary syphilitic affections of the digestive tract dietary expedients and precautions are nearly as essential as specific treatment. The effect of mercury in all of these conditions is good; but the drug should be administered either in the form of the mercurial

[1] Le prog. méd., June 22, 1878, p. 473.

bath or by inunction, so as to spare the stomach and intestines as much as possible. The iodides should be combined with the mercurial treatment. They should be commenced in mild doses and pushed with caution, largely diluted with water, after meals consisting of boiled rice and boiled milk, preceded by large doses of the subnitrate of bismuth. In this way the obstinate diarrhœa of tertiary syphilis may be often checked, and the intestinal ulcers which presumably give rise to it often brought to a successful cicatrization.

The troubles produced by syphilis at the anus and in the rectum require local as well as general treatment. Mucous patches and ulcers, whenever they occur, demand excessive cleanliness, washing with soap and warm water and careful drying, with soft rags. After this there is no treatment better than dusting the surfaces freely with dry calomel. Iodoform in powder is also excellent, if its odor is not objected to, and the judicious use of a point of nitrate of silver upon the ulcers and fissured creases about the anus materially aids the rapidity of cure.

For ulcers within the rectum nothing is better than suppositories of iodoform from four to eight grains, rubbed up with butter of cacao into a soft mass, which should be deposited by means of a suppository tube and repeated once or twice a day. I think that a grain or even two grains of mercurial ointment in such a suppository increases its efficacy without producing irritation. Trélat thinks well of meshes of lint soaked in glycerine containing a little tannin or other astringent, introduced into the rectum. In syphilitic stricture of the rectum stools should always be obtained by the aid of enemata, preferably a thin solution of flaxseed tea. When the ano-rectal syphiloma is advancing, moderate pressure twice a week, used very gently with a soft bougie, is attended by comfort, and, I think, some advantage. Later on, when the contraction of the new tissue is producing fibroid changes in the wall of the gut, the bougie is indispensable; and in the last stage of unyielding fibrous contraction linear section of the whole thickness of the altered tissue with the knife, écraseur, or electro-cautery, alone offers a chance of cure and holds out hope of comfort to the patient.

At any stage of the complaint great advantage may be derived from intelligent treatment, local as well as general. In the case referred to at page 197, where a post-mortem examination confirmed the fact of cure, the patient had already been subjected to two cutting operations for stricture of the rectum, by a surgeon who had not recognized the cause of his trouble and had cut and burned away the flat, external anal tumors. He was little, if at all, relieved by these measures; but eventually cured of his trouble mainly by internal means. The unfortunate perforation of one of his intestinal ulcers terminated the case and allowed an inspection of the rectum, although material improvement in this direction had already been indicated by a cessation of most of the functional derangements of the part. In another personal case I found internal and local means of no avail until I had divided all the thickened tissues posteriorly with the knife, under ether, to the extent of fully four inches up the gut.

SYPHILIS OF THE PERITONEUM.

Syphilis generally spares the peritoneum, even when the viscera covered by this membrane are attacked. Often, however, in connection with syphilitic (especially gummatous) changes in the liver, spleen, intes-

tines, ovaries, the peritoneum becomes thickened and adherent to neighboring layers of peritoneum. Interference with the portal circulation from such causes might occasion ascites.

SYPHILIS OF THE ABDOMINAL GLANDS.

In this connection all the glands of the abdomen, excepting those of the genito-urinary system, come up for consideration.

SYPHILIS OF THE PANCREAS.

This gland, like the salivary glands, is very rarely touched by syphilis. Lancereaux has found, after death, parenchymatous connective-tissue proliferations in the pancreas, and gummy tumors in one case; and Virchow discovered fatty degeneration in inherited disease. Birch Hirschfeld[1] found the pancreas very often indurated, in autopsies upon cases of inherited syphilis.

SYPHILIS OF THE LIVER.

The changes in the liver due to syphilis are true to the two types of syphilitic tissue alteration: the one constructive—a diffuse, parenchymatous, cellular hyperplasia, ending in contraction and induration; the other destructive—the gummy tumor. Amyloid changes in the liver are also ascribed to syphilis.

Diffuse syphilitic hepatitis, in which the connective tissue of the whole gland is involved, does not occur, except in infants with inherited disease. The whole gland grows large, heavy, hard, of a flinty gray color, the glandular structure being more or less obliterated—so much so that, in some cases, it cannot be made out with the naked eye. The new tissue is connective-tissue hyperplasia in the parenchyma, and new cells and nuclei along the capillaries. The liver-cells are compressed, distorted, atrophied by the new-formed tissue, and often in a state of granular degeneration. Softening and breaking down of tissue does not occur in this affection.

On opening the abdomen of a child dead with inherited syphilis, an enormous liver is often found, which has undergone the changes above detailed. It is hard, tense, elastic. A piece of it, cut out, slips away when pinched between the thumb and finger. The organ may be so dense that the finger can only bore a hole in it with difficulty. Collapsed and thickened vessels show on the pinkish brown surface of section as white knots, from which radiate thin whitish streaks. The vessel-walls are sometimes the seat of amyloid degeneration. A dark spot may mark an obliterated bile-duct. The contents of the gall-bladder are sticky and pale (Gubler).

In a circumscribed form, the same diffuse parenchymatous changes occur in the liver of adults with acquired syphilis. It goes on to final atrophy and cirrhosis of the part involved, the cicatrix formed by the wasted tissue contracting deeply into the organ. If many of these contracted spots exist in the same liver, they may pull it down into very

[1] Archiv f. Heilkunde, 1875, Heft 2.

small dimensions, the liver-tissue jutting out between the puckered, contracted spots in a singular manner. The tissue in these limited glandular areas may be normal, or in amyloid degeneration.

The cicatricial circumscribed areas, representing old, diffuse hepatitis, may contain cheesy masses at their centre, such as are left behind by the degenerative changes affecting true gummata, and, indeed, gummy tumors may coincide with the diffuse patches of syphilitic parenchymatous hepatitis. The peritoneum over the depressed cicatricial areas occupying the sites of old disease, is generally thickened. Sometimes the two layers of peritoneum are adherent.

Gummy tumor of the liver occurs as a dense, connective-tissue, radiate mass, with cheesy deposits scattered through it, or as a round, cellular tumor, degenerated at the centre, and separated from the liver substance by a capsule formed of condensed connective tissue. Gummata commence in the walls of the vessels between the lobules. They thus envelop the lobules, which they destroy. Virchow, who, with Frerichs and others, believes that local violence has something to do—as an immediate, exciting cause—with syphilitic changes in the liver, has called attention to the fact that, in the line of the suspensory ligament of the liver, a broad band of connective tissue, interspersed, perhaps, with gummata, is apt to extend between the two lateral lobes, looking as if the violence done to the tissue, by traction upon the ligament during exercise, might be the exciting cause of the changes in this particular locality.

Gummata of the liver may be solitary or occur in great numbers, and of varied size, interspersed through the organ. It is rare for them to soften. Wilks and Moxon have reported cases to the London Pathological Society. They generally undergo fibro-molecular and cheesy degeneration.

Amyloid and fatty degeneration of the liver are found in connection with other changes due to syphilis, or independently of them. Amyloid degeneration of the liver, kidneys and spleen is so often encountered coincidently with syphilitic cachexia in tertiary disease, that the change must be looked upon as in some way brought about by syphilis, although not in its own nature syphilitic, since the same degeneration occurs in many patients who are not at all syphilitic. The change begins in the walls of the small arterioles, and may continue confined to the vessel-walls.

Symptoms of syphilis of the liver.—The changes in size of the liver due to hepatitis may be appreciated by percussion. Inequalities due to extensive cicatricial puckering of the organ may sometimes be made out by palpation. Some pain may be complained of, but as a rule, symptoms in connection with syphilis of the liver are very moderate or absent altogether, the lesion or its cicatrix being encountered after death. Jaundice is the exception rather than the rule, but sometimes comes on and lasts long. Jaundice early in syphilis may be due to catarrh of the bile-ducts, or pressure from enlarged lymphatic glands. Late in syphilis, again, large abdominal lymphatic glands may occasion jaundice, and cicatricial contractions may do the same, as well as cause ascites late in syphilis.

Such digestive, hæmorrhoidal and anasarcous troubles as accompany cirrhoses of the liver may be due to a similar condition of the organ, produced by syphilis. Albuminuria and cachexia often accompany syphilitic degenerative changes of the liver. When these two symptoms coincide with an irregularity of form and indurated lumps, or a fissured edge of the liver, which may be felt, Lancereaux considers them to be pathognomonic of syphilis.

Treatment is that of late syphilis in the adult—a mixed medication with a preponderance of the iodides, especially if there is reason to suspect that the lesion is gummatous. In the infant, treatment by inunction is appropriate; but not much can be expected from it if the malady be far advanced.

SYPHILIS OF THE SPLEEN.

Four varieties of textural change may be produced in the spleen by syphilis: (1) a parenchymatous diffuse splenitis, general or partial; (2) gummy tumor; (3) an increase in the pulp of the organ; (4) amyloid degeneration.

The parenchymatous change is a diffuse, connective-tissue, cellular hyperplasia, going on to the formation of fibres which contract and leave pale, depressed spots, with the peritoneum over them adherent to neighboring organs.

The gummata are fibrous nodules of varying size, cellular and fibrous at the circumference, granular and degenerated centrally; pinkish gray at first, finally a dirty, yellowish white.

The amyloid degeneration coincides with similar changes in the liver and kidneys.

The increase in the pulp has been noticed by Lancereaux, and doubtless is the condition which prevails in the enlargements observed early in syphilis by Weil and Weber, and in the soft enlargement of the spleen described by Virchow.

In inherited disease, the spleen may be larger and harder than usual, but gummata are rarely found in it. Eisenschutz[1] thinks that enlargement of the spleen, easily detected by palpation, is a diagnostic symptom of latent inherited syphilis.

Symptoms.—There are no symptoms of enlarged spleen due to syphilis, unless the anæmia of the first period is in some way due to it. Weil[2] has called attention to an enlargement of the spleen, which he states comes on very constantly in the early stages of acquired syphilis, and disappears under treatment; and Weber[3] reports that this enlargement may be detected between the eighth and the twelfth week after infection; in most cases, in from one to two weeks after the appearance of general symptoms. It is said to continue for from one to two months, and to be favorably influenced by mercurial treatment.

SYPHILIS OF THE THYMUS, THE SUPRA-RENAL CAPSULES, AND THE ABDOMINAL LYMPHATIC GLANDS.

The thymus, which usually atrophies as the child develops, in inherited disease has been found hardened, enlarged, broken down centrally into a puriform material, the seat of diffuse connective-tissue hyperplasia, and of gumma.

Enlargement, gummata, and fatty degeneration of the supra-renal capsules, are met with in acquired syphilis.

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[1] Das latente Stadium der hereditären syphilis. Wien. med. Wochenschrift, 48, 49, 1873.

[2] Deutsch Archiv f. klin. Med., May 15, 1874.

[3] *Ibid.*, 4, 5. 1876.

In neither of these conditions are there any positive symptoms causing the affection to be recognized with certainty during life.

The abdominal lymphatic glands are subject, in late syphilis, to considerable enlargement and to gummatous deposits, which may atrophy or become amyloid, or cheesy, or may soften and discharge, generally upon the cutaneous surface, leaving ulcers and fistulous channels of varying extent and duration. The pressure of these larger glands may interfere with digestion or give rise to jaundice.

Such glandular swellings may be diagnosticated when they can be felt, and are best treated by the iodides, with a certain amount of mercury by inunction.

SYPHILIS OF THE VASCULAR SYSTEM.

All parts of the vascular system are liable to suffer from syphilitic lesions; the heart most frequently, the veins very seldom.

Syphilis of the heart.—A diffuse pericardial thickening and a gumma of the pericardium have been occasionally noted after death. Wagner has described as syphilitic certain miliary granules found on the pericardium.

Diffuse parenchymatous myocarditis also occurs, and most often, either with the diffuse cellular infiltration or independently, gumma of the muscular structure.

Grenouiller,[1] in a thesis on cardiac syphilis, drawing his conclusions from twenty-four cases, collated from various sources, finds that syphilitic myocarditis generally commences as a small gumma, and ends as a patch of sclerosis. Gummy tumor was found, in eighteen out of the twenty-four cases, once during the first year after infection—at an average, however, of ten years. The thick wall of the left ventricle was the commonest seat of the deposit. There were no special symptoms during life, although heart disease was sometimes suspected. About two-thirds of the cases terminated in sudden death.

Anatomically, the gumma of the heart is a collection of small round cells (like a sarcoma), encapsulated and yellowish white on section, often cheesy at the centre. If near the surface, the pericardium or endocardium over them is thickened. They are often multiple.

A general weakening of the heart's action, without any valvular irregularity, attended by slight enlargement of the organ and dilatation of its cavities, seems to be the only symptom upon which a diagnosis can be based. Lancereaux believed that he diagnosticated one case which got well under treatment.

The possibility of embolism, due to bursting of a softened gumma into the cavity of the heart (Oppolzer, Lancereaux), must be remembered.

Treatment is mixed, with preponderance of the iodides.

Syphilis of the arteries.—The arterial lesions of syphilis have been the object of much study during the past few years. Gelatinous nodules, growing from the middle coat of the pulmonary artery, have been found, and smooth, softish tubercles, all presumably syphilitic. The changes in the large vessels, however, which are most common, are atheromatous deposits; and these, when they are found in a syphilitic subject early in life, before they can be accounted for by senile changes, are generally set down as being due to syphilis.

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[1] Paris, 1878.

A diffuse general thickening of the arterial wall, commencing (Heubner) as an endo-arteritis, and sometimes going on to the extent of occluding the lumen of the vessel, appears to be a process very common among the small arteries in syphilis, especially the arteries of the brain (Heubner), although other causes besides syphilis may produce this same arterial thickening (Cornil, Ranvier, Köster, Friedlander). Lancereaux and others have observed this thickening of the vascular wall to a marked extent in the carotids.

As a consequence of syphilitic arterial changes, brain symptoms (Heubner) are not uncommon, due to a cutting off of a portion of the brain from its blood-supply on account of partial or entire closure of the lumen of an artery through thickening of its walls. Cerebral apoplexy is sometimes due to syphilitic arterial changes, and pulmonary apoplexy as well (Weber), while aneurisms are so much more common upon syphilitic patients than upon others, that the relation must be more than mere coincidence.

There are no positive diagnostic signs by which the syphilitic nature of a presumed or a positive (aneurism) arterial change can be established. When such changes occur upon a syphilitic subject, a mixed treatment, with a preponderance of the iodides, is indicated. The effect of treatment upon arterial lesions is not brilliant; but often treatment is of enough value to make it well worth while to push it with firmness and continue it with long patience.

Of the effect of syphilis upon the veins, little is known. J. Hutchinson, in his report on syphilis to the London Pathological Society, thinks that he has observed inflammatory changes about varices and around healthy veins in syphilitic subjects quite frequently, and he infers that these sometimes must be of specific nature.

Of the capillaries it may be stated that their external walls are the habitual starting-points of gummatous tumors, and Lancereaux states that their walls become fatty in conditions of syphilitic cachexia.

The amyloid changes found in late syphilis attending the cachectic stage commence usually in the walls of the blood-vessels, generally the smaller ones, and sometimes remain confined to them.

CHAPTER XII.

SYPHILIS OF THE NERVOUS SYSTEM.

General Pathology of Nervous Syphilis.—Syphilis of the Brain, Pachymeningitis, Gummata of the Meninges, Encephalitis, White Softening, Gummata of the Brain.—Syphilis of the Cerebral Arteries.—General Symptoms of Brain Syphilis, Prognosis, Treatment.—The Special Affections produced by Syphilitic Lesions of the Brain.—Syphilitic Hemiplegia, Epilepsy, Generalized Paralysis, Catalepsy, Chorea, Aphasia, Insanity.—Brain Syphilis simulating Sunstroke often followed by Desire to Sleep.—Syphilis of the Cord.—Syphilitic Paraplegia.—Syphilitic Locomotor Ataxia.—Syphilis of Special Nerves, of Nerves of Special Sense, and Nerves of Motion.—Syphilis of the Sympathetic.

SYPHILIS attacks the nervous system, as it does all other organs, through its connective tissue and its blood-vessels. There is a constructive form which does not soften, but contracts after its formation, and by pinching the delicate nervous cells and tubes gives rise to the most varied symptoms. There is also the gummatous destructive form of disease, which destroys all the tissues implicated by softening or cheesy metamorphosis, and by its own pressure occasions numerous symptoms.

The brain, the cord, and the nerves are also exposed to injury, on account of pathological processes occurring in surrounding structures. The meninges of the brain and cord are liable to inflammatory thickening and to gummatous deposits, the bones of the cranium and of the spinal column may be the seat of necrosis or caries, nodes may grow upon the bones and press upon the delicate nervous structures within. The nerves, as they leave the great centres, are exposed to pinching by a syphilitic thickening of the bony channels through which they escape, and after they are among the tissues by interstitial syphilitic lesions within their sheaths (gummata), and by implication in other syphilitic processes along their track (gummata, pressure by nodes, etc.).

Finally, a large number of symptoms of brain disease, which formerly were seemingly beyond the possibility of explanation, are now found to be due to changes in the walls of the arteries supplying the brain. This has been made very clear of late, by the admirable treatise of Heubner,[1] and the researches of other observers who have followed him. Apoplexies, blood-cysts, occlusion of arteries, and consequent softening of portions of the brain, or at least interruption of the function of such parts, may all be explained easily by the arterial lesions. No greater step toward the comprehension of the effects of syphilis has been made for many years than this one of the recognition of the possible result of syphilis upon the arteries, and the consequent interference of function in the tissues whose blood-supply has been thus cut off or lessened.

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[1] Die Luetische Erkrankung der Hirnarterien. Leipzig, 1874.

The sympathetic ganglia are also exposed to injury by changes analogous to those which affect the brain.

SYPHILIS OF THE BRAIN.

Changes in the bones surrounding the brain may occasion nervous symptoms. Such changes commonly are nodes from the inner table, and necrosis (involving the meninges in inflammatory disturbance). Thickening of the periosteum or disease of the bone, about any of the foramina through which the cranial nerves find exit, leads to loss or impairment of the function of that nerve.

The meningeal lesions are pachymeningitis and gummatous deposits.

Pachymeningitis.—This is a connective-tissue cellular proliferation going on to organization into fibrous thickening of the tissues involved. It generally occurs over the anterior lobes of the cerebrum, on the convex surface, or at the base. The dura mater is most often involved, the pia mater next, the arachnoid least often. There may be disseminated patches of disease, or a large area may be generally implicated. When the pia mater is involved, the arachnoidal surfaces may adhere, and the underlying brain surface be included in a uniform sclerosis, the thickened, tough membranes being adherent to the brain, so that they cannot be lifted without lacerating the surface of the latter.

Gummatous deposits in the meninges are found as scattered, yellow, softened or cheesy nodules, amidst the sclerosed patches of pachymeningitis, or spread out in yellow layers between the thickened meninges, or in the shape of distinct tumors between the dura mater and the bone, in the substance of the membranes, or on the surface of the brain. Such tumors, at first cellular, gray and soft, become gelatinous, with fibrous envelopes, then fibro-granular, finally cheesy.

The lesions of the brain-substance are: a diffuse encephalitis, a white softening, gummata.

Encephalitis is a new cellular formation in the delicate connective tissue of the brain, and along the vessels. Like the same process elsewhere, it finally goes on to form a sclerosed patch pinching the tender nerve-elements.

White softening occurs over a limited area, which may have become deprived of its blood by the obliteration of the artery supplying it, on account of syphilitic deposits in its walls.

Gumma of the brain forms in the outer coat of the small arteries, and spreads from thence. Gummata are not common in the brain-substance, and when found, it is most often in the cerebrum near the surface. The tumors exist as fibrous masses with cheesy centre, or as a soft accumulation surrounded by a wall of condensed connective tissue; occasionally the contents are absorbed and a cyst remains. The whole gumma may be absorbed, leaving a fibrous cicatrix.

SYPHILIS OF THE CEREBRAL ARTERIES.

Heubner's monograph on syphilis of the cerebral arteries has called attention to the frequency of this lesion in syphilis, and explained many of the cases which formerly had to be ranked as nervous syphilis sine *materiâ*, because no lesion could be found. Doubtless there is a nervous

syphilis sine materiâ. The analgesia and anæsthesia of secondary syphilis, and some of the paralytic attacks coming on a few months after chancre, are doubtless due to the direct effect of the poison, or to irregularities in the circulation of the nerve-centres, dependent essentially upon the influence of the poison of syphilis, without tissue-change. Analogous phenomena occur in nervous gout. It is not well, however, to make any division of a set of symptoms, under the head of nervous syphilis without physical lesion, because the classification tends to encourage negligence in pathological diagnosis. Very possibly lesions will be eventually found to cover all cases, since the arterial lesions already account for many nervous syphilitic troubles, formerly incomprehensible, so far as their pathology was concerned.

The customary lesion of the arteries produced by syphilis is, according to Heubner, an endo-arteritis commencing as a round-celled deposit in the intima between the endothelium and the membrana fenestra. The growth of these cells forms a lumpy swelling, which diminishes the calibre of the artery. Later on, all the coats of the vessel become the seat of a round-celled infiltration.

As a result of these changes, the proximal side of the vessel is apt to become dilated, rupture, and hemorrhage may occur or thrombus may form at the constricted spot. Atrophy of the normal elements of the vessel-wall results from the presence of the new growth. Spontaneous cure occurs by obliteration of the vessel.

The carotid arteries and their branches are more often involved in this process than the basilar. Syphilitic arteritis is always a late lesion. Heubner only encountered it once within six months of chancre; and in this case it seemed quite probable that the patient's syphilis had antedated his supposed chancre by several years.

Symptoms of brain syphilis.—Symptoms of the most varied character are produced by syphilis of the brain—symptoms involving the intellect and all of the functions of the body, symptoms simulating a variety of cerebral diseases.

Headache is a prominent symptom in all stages of syphilis. Early in the disease it may be neuralgic, or due to anæmia or hyperæmia. Later it implies lesions of the bones of the cranium, or gummatous processes, or pachymeningitis. It is generally intense in all stages of the disease, and worse at night.

Vertigo early in syphilis is believed to be due to congestive or anæmic conditions of the brain; later to material lesions of all sorts, particularly arterial degenerations.

Convulsive seizures, especially unilateral spasm (Jackson), epilepsy, vomiting, photophobia, strabismus, varied lesions of the eye, dementia, weakness, loss of consciousness—all these are symptoms apt to be connected with peripheral lesions, pachymeningitis, and gummatous processes near the surface of the cerebrum or cerebellum, or at the base of the brain.

Gummata of any size are apt to produce symptoms similar to those due to other cerebral tumors similarly situated.

Encephalitis may give rise to disturbance of the intellect, mania, insanity, paralysis, epilepsy without aura, convulsions without unconsciousness, often slow in coming on.

Arterial lesions may occasion aphasia, hemiplegia, and troubles of the intelligence.

Death from syphilitic brain trouble may be the result of the bursting

of a vessel, gradually progressive enfeeblement and cachexia; to wasting of the nerve-force or to encaphalitis.

The symptoms of syphilis are greatly varied, and are not proportionate to the extent of the lesion or to its situation. Frightful attacks of nervous symptoms terminating life sometimes reveal nothing to the pathologist more serious than arterial lesions; while, on the other hand, tumors and extensive meningeal troubles connected with lesions of bone are found after death, when there has been little more than local pain during life to direct the physician's attention to the brain. Occasionally, serious lesions are found attended by symptoms during life, where there has been no complaint of pain.

Indeed, syphilis is picturesque and irregular in its nervous expressions, as well as in its other symptoms; and it is often, by this very quality of irregularity in the grouping of the nervous symptoms, that a diagnosis of syphilitic brain disease can be made.

Certain groupings of symptoms are believed to be pathognomonic of syphilis. One of these is unilateral spasm commencing in the fingers or thumb, running up one limb and down the other, without unconsciousness, sometimes terminating in a general convulsion with loss of consciousness (Jackson). Speech may or may not be involved, and partial paralysis may or may not follow on the side which was the seat of the hemispasm.

Optic neuritis and mydriasis very often attend syphilitic nervous symptoms due to syphilis.

Balfour[1] calls attention to the fact that a coexistence of facial neuralgia, with paralysis of any of the nerves going to the muscles of the eye, forms strong presumptive evidence of cerebral syphilis, since the cavernous sinus, the only point where these different nerves run near each other, is a favorite seat of syphilitic deposit.

In general, an irregular grouping of nervous symptoms is suggestive of syphilis, such as paralysis of a group of muscles of one arm and the leg of the opposite side, coinciding with mydriasis or optic neuritis. The explanation of this is that the lesions of syphilis are scattered and varied, all tissues are liable to suffer from its influence, and many of them at the same time.

The mental disturbances of syphilis are very varied. Certain qualities of mental derangement in connection with physical (paralytic) symptoms are so often encountered together as to have in them something almost clinically pathognomonic. There is a certain quality of brain-weariness which is constantly complained of. The patient cannot fix his mind upon anything intently; his brain gets tired at once. Sometimes he cannot even read a newspaper, he cannot cipher, often he cannot write a letter, while he can talk and laugh as well as ever, and to a careless observer does not appear to be at all deficient in brain-power.

There is also, generally, a tendency to emotional excess in patients whose brains are weakened by the physical lesions of syphilis. Such individuals will laugh or cry at the very slightest provocation, they get gloomy and frightfully depressed sometimes without cause, while other patients seem to be made careless and happy by their malady, their whole character being changed. This latter result is less common than the others.

Finally, there is a hebetude, a dementia quite common in connection

[1] Edin. Med. Jour., Oct., 1875, p. 289.

with advanced brain lesions due to syphilis. The patient will exhibit a slowness of apprehension which is phenomenal. He will be painfully slow in grasping ideas which are presented to him, and equally deliberate in expressing his own ideas in reply. Such patients look blank and stupid in the face. The muscles of expression seem to be powerless. A stupid, dull stare greets the inquirer in response to every idea presented to the patient. In these cases the patient, who is perhaps paralyzed on one side, will sit with his mouth open and saliva dribbling upon his coat, until he is told to shut his mouth, when he will slowly and stupidly obey. He will leave food in his mouth unmasticated, seeming to forget it, and yet may retain his reasoning powers, his speech, and all his intelligence—much blunted, of course, but not absent.

When any of these three varieties of intelligential variation, emotional excess, brain-weariness, hebetude, coincide with mydriasis, localized muscular paralysis, and tender shins, syphilis may be predicated as a cause of these phenomena, with nearly absolute certainty of making a correct diagnosis. Pain in the head, worse at night, makes the diagnosis more certain, and improvement under antisyphilitic treatment removes any lingering doubt which may have arisen from failure to find physical evidences of past syphilis, or a history of the disease.

The prognosis of the nervous symptoms of syphilis is always relatively good. That is, no matter what, or how severe, or how extensive, or how long standing the symptom, there is, as a rule, more hope of effecting its cure, if syphilis can be made out to be its cause, than if it originated from any other malady. Apparently hopeless cases of the most profound coma, symptoms resembling brain-softening in all respects, paralyses of the most varied kinds, blindness and deafness, furious epilepsy, violent mania, insanity, general paralysis, dementia—none of these conditions in their worst form involve more than a reserve in their prognosis, if syphilis is their cause. Many cases, which, on account of their long standing, cannot be perfectly cured, are yet capable of vast improvement, by the judiciously vigorous employment of an active anti-syphilitic medication, including a trial of the iodides pushed unsparingly.

As to the liability of occurrence of nervous symptoms due to syphilis in a given case of the disease, it is impossible to speak with much assurance. There is a general impression which Broadbent[1] has formulated, citing Gros and Lancereaux, Braus, Buzzard and Moxon, as corroborating his opinion, that it is chiefly when secondary symptoms are light, or when tertiary symptoms come on very early, that symptoms due to lesions of nerve-tissue are to be feared. There is some foundation for this, doubtless, but it is far from being a rule. Many cases are very light at first, and very severe at the end; others seem to extend their violence in the cutaneous outbreaks of the first eighteen months of the disease, and then cease entirely; but an absolute rule is very impossible in this, as in most other general questions regarding syphilis.

Syphilis acts differently, according to the physical predisposition and the constitution of the person who suffers from it. Gouty and rheumatic patients, and those with general nervous tendencies, certainly are more apt to suffer from brain syphilis than others, and these patients are just the ones who habitually have light, but protracted attacks of superficial papulo-squamous lesions throughout the existence of their malady. It is not because they have light early syphilis, that later on

[1] Lancet 1874, 1 nos., 2–6.

they get brain disease, but both the results arise from one and the same predisposing constitutional cause, and not at all from any peculiarity in the quality of the syphilitic virus which they have absorbed, or its quantity. Such patients are apt to have more pains and neuralgic symptoms early in their attacks, than others; headache, side-ache, bone-ache, anæsthesia, analgesia, vertigo, etc.

Treatment.—The general treatment of nervous syphilis keeps in view the delicate nature of the structures which are threatened. The gummatous exudation which is pressing upon nerve cells and fibres must be speedily removed at any cost, the congested periosteum must be restrained in its tendency to construct a bony node, or to thicken into an irritative patch upon the cerebral surface, the thickening in the arterial wall must be arrested before it closes the calibre of the vessel—or delicate nerve-tissue will be destroyed, which no human power can restore. Consequently, great vigor is called for in the employment of the means we have at hand, and great judgment and care in the management of all the surroundings of the patient, his diet, his habits, his hygiene.

The light congestive lesions which give symptoms early in syphilis get well on mercury alone; those of the later variety require large doses of the iodides often, preferably combined with the mercurials.

Refinements in diagnosis, however, are not always possible, or proper, in face of probable grave lesions threatening important functions; and it is better in all cases of serious nervous disease due to syphilis to employ both the mercury and the iodides, and to push them both boldly until the symptoms yield. Mercury should be given by the vapor-bath or by inunction, the stomach being reserved for the iodides. The latter should be used without stint, commencing at a gr. x. or gr. xx. dose, according to the severity of the symptoms and the date of the attack from chancre, and increasing rapidly up to the point of tolerance, using all precautions to protect the stomach (p. 134).

After the symptoms have yielded, treatment should be continued for a long time, and then be slowly dropped, tapering off the course of the iodides, and continuing with the mercurials, watching the patient for any evidences of possible relapse.

THE SPECIAL AFFECTIONS PRODUCED BY SYPHILITIC LESIONS OF THE BRAIN.

A few words, setting forth some of the peculiar qualities which attach to certain affections of the nervous system when due to syphilis, will make it easier to differentiate them from analogous affections dependent upon morbid processes, the nature of which is not syphilitic.

SYPHILITIC HEMIPLEGIA.

Hemiplegia due to syphilis is usually observed in patients who are comparatively young, since it generally occurs within a few years of chancre, and chancre is more often acquired by the young than by the old. It has been observed quite early in syphilis. Taylor[1] reports a case

[1] Journal of Nervous and Mental Diseases, January, 1876, p. 20.

in the fifth month from chancre, but it is more common after several years. There are three varieties of attack :

1. Sudden loss of motion in one side without any previous warning, excepting, perhaps, persistent pain in the head, worse at night. In connection with Professor Van Buren, I have reported a number of instances of this variety of attack.[1] Under these circumstances there is commonly no loss of consciousness with the paralytic stroke.

2. Hemiplegia may come on very slowly, taking perhaps several weeks to beome complete. The face may become paralyzed, and then, gradually, the upper extremity. Finally, the loss of power extends to the thigh and leg, or the lower extremity may be spared altogether. In this form also there is no loss of consciousness with the attack.

Finally, 3, hemiplegia may be due to syphilitic degeneration of an artery which, thinned by gummatous deposit, or dilated behind an obstruction, may give way and occasion true apoplexy. This form of syphilitic hemiplegia may be attended by loss of consciousness, like ordinary apoplexy.

Headache localized in one spot very often precedes the seizure by several weeks. The intensity of this headache is sometimes extreme, particularly at night ; and if the lesion be peripheral, pressure upon the bone over it increases the pain.

Of the hemiplegia itself, it may be partial or complete. Motion and sensibility may both be abolished, but sensibility is commonly less impaired than motion. Sometimes one side is paralyzed in its sensibility alone, motion being normal. Hemispasm of the affected side may precede the paralysis. Several mild attacks of hemiplegia may follow each other at short intervals, and, finally, be succeeded by a full attack, which remains permanent.

Other general nervous symptoms, intelligential or emotional, such as have been described (p. 208), generally accompany syphilitic hemiplegia; but upon this point there is no certain rule.

I have seen one case of partial syphilitic hemiplegia in a young girl with inherited disease.

Early treatment is sometimes followed by rapid and complete cure.

SYPHILITIC EPILEPSY.

Epilepsy generally comes on several years after chancre. Bumstead has observed a case within a few months from the primary lesion, and Althaus[2] has reported a case in a child with inherited disease. The convulsive attacks in this affection are not exactly like those of true epilepsy, and the patient is generally a grown man, instead of a youth, as he commonly is in true epilepsy. The convulsion in syphilitic epilepsy is rarely preceded by an aura. It nearly always commences in unilateral spasm. There are night and day attacks, as in true epilepsy, and, in syphilis, a tendency to an explosion, as it were, a number of attacks occurring in rapid succession, followed by a considerable interval of calm. This peculiarity, however, is also noticed in true epilepsy. In syphilitic epilepsy, as in the ordinary form, there occur the half attacks, as well as the full attacks ; but the former are not so much confined to the head as in true

[1] Syphilis of the Nervous System : N. Y. Med. Journ., Nov., 1870.
[2] Med. Times and Gaz., April, 1874, p. 389.

epilepsy; there may be only a partial unilateral spasm, passing away without reaching the extent of a full attack.

The features which are commonly relied upon to diagnosticate syphilitic epilepsy (besides the history) are: the relatively advanced age of the patient; the existence of persistent, fixed headache before the attack, worse at night; a persistence or aggravation of the intellectual symptoms (hebetude, etc.) between the attacks, instead of a diminution of the same, such as is encountered in ordinary epilepsy; and the peculiar character of the attack, commencing perhaps habitually in a thumb or finger, and becoming first unilateral, then general.

Special paralysis of the cerebral nerves is less often observed with syphilitic epilepsy than with some of the other forms of nervous syphilis. Fatal cases generally terminate with profound coma, more or less prolonged.

OTHER FORMS OF NERVOUS SYPHILIS AFFECTING THE MUSCLES.

Generalized paralysis, closely simulating the generalized paralysis of the insane, is not a very infrequent symptom of brain syphilis. There is no constant lesion found in this condition. The patient is more apt to be depressed and to suffer from hebetude than to entertain ideas of grandeur, as in non-specific general paralysis. Catalepsy of syphilitic origin has been encountered, and even chorea; but these affections are not well defined, and are very rare. All of these maladies, when due to syphilis, respond to a well-directed, vigorous treatment. A cure may not be possible in all of them, but much improvement can generally be attained.

SYPHILITIC APHASIA.

This affection is by no means uncommon as a result of syphilis of the brain. It may come on quite early in the disease, but, like the other nervous affections, is generally quite late. All the forms exist, due to syphilis—the loss of articulate speech with ability to write, loss of speech as well as of the power of writing, the use of words inappropriately, the loss of one language while another is remembered when the patient could talk in two tongues. The prognosis is better in syphilitic aphasia than in any other form, but there is nothing in the affection itself which stamps its syphilitic nature upon it. History and concomitant signs must be relied upon for a diagnosis. Treatment commenced promptly is often very effective.

SYPHILITIC INSANITY.

Mania, acute and chronic, hebetude, dementia, and general paralysis are certainly in some cases due to syphilis. History, accompanying phenomena, and other symptoms affecting the nervous system due to syphilis, have to be relied upon for a diagnosis. The whole matter is clothed in considerable uncertainty; but, where there can be any certainty of the existence of syphilis, no consideration should deter the physician from giving the patient the benefit of the doubt. The effect of treatment is often very prompt in these cases, and lifts the cloud from the patient's brain, an effect as apparent to the sufferer and his friends as it is to his physician.

I have known a case of profound coma where there was no positive

history of previous disease, and where the patient could give no account of himself, yet where a diagnosis of brain syphilis was made and acted upon, to the prompt relief of the patient. In such cases it is well to search the whole body of the patient. Look for circular white scars with a pigmented margin, examine the pupils for mydriasis. Search the retina with the ophthalmoscope for optic neuritis. Pinch the shins, even if no nodes are found, and see if the patient shrinks. Press upon all the different parts of the skull, and notice whether the patient moves, as if he disliked pressure upon any particular spot. Finally, examine the throat for cicatrices of past syphilitic lesions, and frequently, without asking a question, a diagnosis of nervous syphilis can be made, and a treatment instituted which will restore the patient promptly to the exercise of his functions.

BRAIN SYPHILIS SIMULATING SUNSTROKE.

Desire to sleep is often a marked symptom in the case of patients with brain syphilis. It may be connected with the most varied symptoms, or occur independently of other symptoms of a nervous order. It is most apt to come on after an attack of supposed sunstroke.

Patients in late syphilis not infrequently first show nervous trouble in the following way: on a hot day, while under exertion, or, sometimes, when doing nothing, such a patient will be overpowered with the heat, as it is called. There will be faintness, vertigo, pain in the head, perhaps loss of consciousness. These symptoms are apt to be followed by loss of strength, inability to undergo physical exertion, positive incapacity for any mental effort, and with this, often a languid condition of general incapacity and inability to do anything, which is very distressing to the patient. With this, sometimes, there comes an intense desire to sleep. The sleep does not satisfy. With much sleep, the patient is no better; and with little sleep, not materially worse. Such patients often eat very well—exceptionally well. They grow fat, but cannot seem to get any good out of their food in the way of strength. Heat, especially the heat of the sun, makes them worse. They feel better in winter, but the summer wilts them down, makes them good for nothing.

These patients do not generally associate their symptoms in any way with their antecedent syphilis—perhaps long forgotten—but consider that they have been "touched by the sun," as they often put it, and they seek for comfort through years of tonics and electricity, but do not find it. A mixed treatment of mercury and the iodides is the best tonic for these cases; but they often drag along very slowly, and in the end remain more or less intellectually and physically broken, and emotionally weak for the remainder of their lives. Zittman's decoction sometimes freshens up such cases amazingly, or a course at a water-cure, or at the dry cure in Lindeweisse.

SYPHILIS OF THE CORD.

The lesions of syphilis affecting the cord are much the same as those which have already been detailed in connection with syphilis of the brain. The bones of the spinal column suffer from exostoses and necrosis, its fibrous and vascular membranes become involved in pachymeningitis, or the seat of gummatous deposits, in a diffused or circumscribed

form. The cord itself may become soft in spots, or, more often, sclerosed, in connection with diffuse, hyperplastic, connective-tissue proliferation, or gummatous deposits, or arterial changes.

The symptoms attending all these lesions vary with the locality and extent of the latter. The diagnosis is generally obscure, and depends much upon the history of the concomitance of other symptoms—nervous or otherwise—of syphilis. The treatment is often so effective as to unexpectedly bring about a cure in the most seemingly desperate cases—a fact which makes the prognosis of syphilitic affections of the cord relatively very good.

The symptoms of syphilis of the cord are, loss of motion or sensation in the arm, leg, or body, along the course of certain nerves, the roots of which may be involved in the lesions, neuralgias—sometimes very intense, and worse at night—paraplegia, and a spurious form of locomotor ataxia.

SYPHILITIC PARAPLEGIA.

Paraplegia due to syphilis is rarely complete. Occasionally coming on within the first year after chancre, it is usually one of the very latest of the nervous manifestations of syphilis. It has been encountered in inherited disease. It often comes on insidiously. The patient notices that his legs are heavier than usual. He stumbles more often and on less occasion than is his wont. He gets tired without due cause. He drags his feet more than usual. The bladder always suffers along with the muscles of the thighs, and legs, and the rectum, usually, as well. The patient cannot throw a good stream of urine, and cannot extrude his fæces with any satisfaction to himself.

At this stage most cases are diagnosticated to be reflex urinary paralysis, and the bladder is often treated, the urethra slit, the prepuce cut off, in the hope that, the supposed cause of reflex paralysis being removed, the patient will get well—a vain hope in these cases.

The legs are generally unequally paralyzed, and one of them much more than the other. Certain groups of muscles in the different legs suffer, perhaps symmetrically on the two sides, sometimes not so. Generally sensibility remains intact, occasionally it is abolished.

There is rarely any numbness in the extremities, or pain in the back, or convulsive twitchings; and there are no pains in the legs unless the lesion is confined to the meninges of the cord. The sensation of constriction around the body is not usually complained of. Indeed, there is no pathognomonic sign by which the syphilitic nature of a given paraplegia can be even surmised. The history, the absence of any cause other than syphilis, the presence of other evidences of syphilis of the nervous system, or of any of the tissues, are important aids in the differential diagnosis. The good effect of an energetic treatment is often quite prompt and very obvious from the first. Mercury is of more value, relatively, in treating syphilitic lesions of the cord, than in connection with similar lesions in the brain. Inunction, carried to the extent of touching the mouth, is to be tried, if an ordinary mixed treatment with preponderance of the iodides, has been pushed without success.

Old cases of paraplegia, due to syphilis, do not generally get entirely well under any treatment. They improve to a certain extent, and then stop. The emotional and other accompanying intelligential phenomena may cease, and the patient become absolutely well, while his bladder, rec-

tum, and certain muscles or groups of muscles in the lower extremity, remain permanently weakened.

In one such case, seen with Dr. Van Buren, it was necessary to apply an apparatus, with an arrangement of rubber straps to represent the hamstring muscles, all of which on both sides were much atrophied, in order to allow the patient to walk erect. The bladder calls for attention so long as its function is interfered with by the lesion causing syphilitic paraplegia, and sometimes for the rest of the patient's life. Care must be taken to see that the bladder empties itself properly; and should it not do so, the catheter must be gently used and the bladder washed out at stated intervals. It must be remembered that the power of the bladder to resist the impressions produced upon it by local violence is diminished, on account of the damage to its nerves by the syphilitic lesion. Consequently, much more care and gentleness than usual is necessary in the use of the catheter, to escape lighting up cystitis of the vesical neck, a complication which causes much pain and the loss of time, and perhaps may lead to an inflammation so profound as to permanently thicken the lining membrane of the bladder and leave it in a state of mild chronic cystitis, from which it never recovers. It is wiser to use enemata for the rectum than to depend upon cathartics.

SYPHILITIC LOCOMOTOR ATAXIA.

Syphilis can certainly produce ataxic symptoms in the lower extremities. Fournier[1] has collected a number of cases of his own, of Féréol, and others. Whether the ataxic symptoms, however, can be called true locomotor ataxia, is the question. Certainly, the symptoms of true locomotor ataxia may be so closely simulated that it is impossible to say, clinically, that the disease produced by syphilis is not locomotor ataxia, and certainly, also, treatment greatly improves these cases. I have observed several cases in which the violent pains in the muscles were present, the strength of the muscles preserved, and yet inco-ordination of movement so marked that the patient could not walk without difficulty, and not run at all. Such patients walk in a very stiff, clumsy way, bringing their heels down solidly on the floor, but yet very unsteadily. They cannot stand on one leg, cannot run, cannot stand firmly with the eyes shut, can hardly walk at all or turn around with the eyes shut, cannot feel the ground plainly under their feet, or touch a given object promptly with the end of the foot, when asked to do so. I have not investigated the tendon reflex in syphilitic locomotor ataxia.

The legs, in these cases, remain firm and strong muscularly, although the patient thinks they are weak, until the contrary is proved by an attempt on the part of his physician to flex or extend the leg in opposition to the patient's will. The bladder in these cases is always involved in the lack of power of co-ordination between the muscles which control its function. Generally there is no atony, the expulsive power is good, but there is more or less persistent spasmodic stricture, the cut-off muscles of the deep urethra failing to relax in response to the patient's will. Such cases are apt to become annoying and to call for the use of the catheter. The bladder itself does not generally require washing or other treatment. The rectum is not generally interfered with, in its function, to any marked extent.

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[1] Gaz. méd. de Paris, December 30, 1876.

I have seen one case where paraplegia with wasting of the muscles and great loss of power in the lower extremities came on, produced by syphilis of the cord. The patient could not get about without crutches. Under treatment he got well of his paraplegia, but the sclerosed patches left in his cord by the antecedent syphilitic lesions produced ataxia. His muscles increased in strength, his legs and thighs grew visibly in size, he discarded his crutches; but presently he got a sensation of constriction about the body, and found that he could not control his legs. He had to resume a cane, and finally crutches again, although his legs and thighs were now large and firm, and no effort on my part could flex or extend his leg against his will. Bladder symptoms, which had come on in this case with the paraplegia, persisted during the ataxia.

The treatment of ataxia due to syphilis is that of tertiary syphilis—mixed treatment, with an excess of iodides. I believe, however, that mercury used freely has more effect in these cases than the iodides, and have seen good effects follow a vigorous course of inunction.

The effect of treatment is slow and often unsatisfactory; I think more so in ataxic syphilis than in any other. It may be that the sclerosis causing ataxia is secondary to previous syphilitic deposits, and, being pseudo-cicatricial, is of course permanent and not influenced by treatment. These cases are so rare that it is hard to make deductions about them. I have not met more than half a dozen cases in all. I cannot recall more than one reasonably perfect cure; but all the cases were improved by treatment.

SYPHILIS OF SPECIAL NERVES.

The gummatous, bony and pachymeningeal changes, so common at the circumference of the great nervous centres, often bring about symptoms referable to implication of the different nerves dependent on pressure at their points of exit through the foramina, or implication along their course (*e. g.*, in the cavernous sinus) in gummatous changes. Hence, the disorderly grouping of nervous symptoms has been considered to be suggestive of syphilis as a cause of all the various phenomena, since the lesions of syphilis are apt to be multiple and scattered, without any particular order in their distribution, and it is natural for the symptoms to partake of the same character.

Again, the special nerves themselves, any of them, may occasionally suffer from congestive, hyperplastic or gummatous changes in their connective tissue, or sheaths at any part of their course, or be involved in neighboring gummatous processes or other tissue-changes. In this way disorderly symptoms of different nerves may come on, due to syphilis as a cause.

Finally, the essential influence of the syphilitic poison, without physical lesion, doubtless occasions some nervous symptoms, especially early in the disease, such as neuralgias, inordinate appetite, sciatica, local areas of analgesia and anæsthesia at the backs of the hands and elsewhere.

Heubner[1] states that it is unusual for any of the special nerves to be involved when the nervous symptoms are due to lesions of the cerebral arteries (syphilitic endo-arteritis).

No nerve in the body is free from the possibility of being attacked by syphilis, but certain ones are much more often involved than others; the

[1] Op. cit., p. 228.

motors of the eye, the seventh pair, the fifth pair, and the spinal nerves take the lead. Among the nerves of special sense, the optic suffers most often, optic neuritis being very common in connection with syphilis of the brain, the portio mollis of the seventh pair coming next in frequency, the olfactory third. The sense of smell is not often injured except in connection with ulcerative or necrotic changes within the nose, and the sense of taste very rarely forsakes a patient except in connection with destructive changes in the mucous membrane of the pharynx and nose, or extensive gumma of the tongue.

The nerves running to the muscles of the eye lose their power very often through syphilis, the third most commonly of all. When the function of the third nerve is interrupted, or of portions of it, the result is ptosis (quite common), mydriasis (very common), divergent squint (least common). Mydriasis is so common as to be almost constant in brain syphilis. It may be due to optic neuritis in an advanced state; anything which blunts the sensitiveness of the retina to light will make the pupil dilate. When mydriasis occurs alone, as it often does, without any evidence of retinal cause or loss of function of the third nerve, the short ciliary branches coming from the lenticular ganglion are the only ones which functionate imperfectly. The lenticular ganglion presides over the dilatation and contraction of the pupil as well as over accommodation, and, as Hutchinson[1] has pointed out, when there is cycloplegia (paralysis of the ciliary muscle) and a motionless pupil, the orbital muscles acting well, there must be disease of the lenticular ganglion, and this condition of things does sometimes occur in connection with syphilis. It is far more common, however, to find mydriasis occurring alone, all the other muscular conditions in and about the eye being normal. Tait and Tuke have reported cases of long-persistent myosis due to syphilis.

About the ptosis and the squint there is nothing special to record. These symptoms, as well as the mydriasis and the myosis, yield to treatment of the stage of syphilis in which they occur. The mydriasis is perhaps, of all, the most persistent.

The patheticus nerve (fourth pair) has been reported paralyzed by syphilis (Graefe), and the sixth pair also occasionally suffers.

Facial neuralgia, or, more rarely, anæsthesia due to syphilis of the fifth nerve, is sometimes encountered, yielding to mercury early in syphilis, and more slowly to the iodides later.

Facial paralysis is quite common in syphilis. Early in the disease this symptom has been noted. It is mild in character, and yields to mercury. Late in syphilis it may come on alone or in connection with other symptoms, and not infrequently it is the forerunner of some serious outburst; it may precede a general attack of hemiplegia by several days. It yields, sometimes slowly, to mixed treatment, and especially to the iodides in large doses.

The other pairs of nerves are very seldom involved by syphilis, but they are not exempt.

The spinal nerves rarely suffer in a neuralgic way, but paralyses, anæsthetic and neuralgic troubles, may involve any of them occasionally. Pleurodynia is common in the anæmia of early syphilis and in the cachexia of the tertiary stage. Sciatica of syphilitic origin is not common or well known, but undoubtedly occurs. N. B. Emerson,[2] of New York, in

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[1] Lancet, Feb. 10, 1877, p. 199 (London Path. Society).
[2] Trans. Am. Neurological Association, N. Y., 1877.

an excellent paper on the subject, has given cases occurring early and late in the disease.

SYPHILIS OF THE SYMPATHETIC.

The sympathetic ganglia are not left unmolested by syphilis. Petrow, in 1873, called attention to changes produced in the sympathetic ganglia by syphilis, pigmentation, and colloid degeneration of nerve-cells; interstitial connective-tissue hyperplasia causing atrophy of nerve cells and fibres; enlargement and proliferation of the endothelium surrounding the nerve-cells, followed by fatty degeneration.

Hutchinson believes that the dyspepsia of syphilis is due to some obscure disease of the sympathetic ganglia. Disease of the lenticular ganglion has already been referred to.

In cases of repeated cerebral congestion due to syphilis, Althaus[1] premises that the superior cervical ganglion of the sympathetic is the seat of organic change.

As may be observed from what is written above, the effect of syphilis upon the sympathetic system are mainly conjectural. Very little is known about it, much is left to discover.

Since attention of late years has been especially directed toward the nervous symptoms of syphilis, many discoveries have been made. Fournier's recent book (La syphilis du cerveau. Paris, Masson, 1879), gives perhaps as complete a showing of the subject as any that has been written, and will repay perusal.

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[1] Med. Times and Gaz., Nov. 10, 1877.

CHAPTER XIII.

SYPHILIS OF THE GENITO-URINARY SYSTEM IN BOTH SEXES.

Syphilis of the Kidney.—Syphilitic Albuminuria.—Syphilis of the Penis.—Syphilis of the Testicle; Epididymitis, Orchitis (Diffuse, Gummatous).—Diagnostic Table of Syphilitic, Tubercular, Cancerous, and Sarcomatous Enlargement of the Testicle.—Treatment of Syphilis of the Testicle.—Impotence due to Syphilis.—Syphilis of the Genital System in the Female.—Functional Derangements of Menstruation due to Syphilis.—The Effect of Syphilis upon Pregnancy.—Cause of Abortion in Syphilis.—Syphilis of the Mammary Gland, Diffuse, Parenchymatous, Gummatous.

SYPHILIS OF THE KIDNEY.

SYPHILIS affects the kidneys in three forms: as interstitial, diffuse, connective-tissue cell hyperplasia, as gummy tumor, and as amyloid degeneration.

The diffuse chronic syphilitic nephritis is similar to other parenchymatous forms of interstitial nephritis, except that it is more apt to occur in patches, and that upon section small clusters and collections of cells (gummata), are often found scattered through it. The patches of circumscribed disease become contracted and condensed with the progress of the affection, and the capsule adheres to them.

Gummata are not often met with in the kidney. They rarely get larger than peas. In structure they resemble gummata of other organs. They are always associated with more or less diffuse, parenchymatous nephritis, each gumma being situated in a condensed band of connective tissue. Gummata of the kidney do not seem to exist alone. If they are found, the same lesions may be looked for in the liver and spleen with confidence that they will be discovered there.

Amyloid degeneration of the kidney has in it nothing which is specific. It may be associated with other lesions due to syphilis, or exist alone. In the latter case it is the rule to find the liver also and the spleen to be amyloid; but this degeneration may exist in all these organs, and yet the patient have no syphilis. Nevertheless, amyloid degeneration of the viscera is common enough in connection with late syphilitic cachexia to have attracted general attention; and although the change is not in itself specific, it is undoubtedly in some way often due to syphilis as a cause.

SYPHILITIC ALBUMINURIA.

The only way in which the existence of syphilitic lesions of the kidneys can be even surmised during life is by the presence of albumen in the urine, with or without casts, for the ordinary tissue-changes in the

organ are not attended by local pain or general fever. There may be symptoms of uræmia (but very seldom) and general anasarca (equally rare), but I am not aware that albuminous retinitis occurs; and often there are no symptoms at all, excepting the presence of albumen in the urine, to declare that the kidneys are not sound.

Such a case was observed by me, in connection with Dr. Van Buren, in the person of a patient seen in consultation with Dr. Dubois. The urine was loaded with albumen, so as sometimes to boil into a solid white mass, and it never contained any blood or pus. No casts were found, the specific gravity ranged high, the general health remained perfect in all respects (except that the patient grew thin), there was not the least uræmia or swelling of the face or legs, and occasionally the quantity of the albumen in the urine would change materially without cause.

This patient eventually recovered entirely, every trace of albumen disappearing from the urine, which became as light, clear, and bright as sherry, and remained so after boiling and adding nitric acid.

I have seen several other cases of albuminuria, which came on during the course of syphilis. They are generally unimportant, and get well under treatment. I am certain that in some cases slight transient albuminuria is produced by the prolonged use of iodide of potassium in large doses. This ceases on leaving off the drug.

Hans Hebra[1] reports a case of syphilitic paraplegia cured by treatment. A month later the patient came back with swollen legs and intense albuminuria, which got quickly well under large doses of the iodide of potassium. M. Bradley[2] has reported general anasarca in a child with inherited syphilis, four months old, who had a papulo-squamous eruption and albuminuria. Mercury with chalk cured the child of its skin disease and its albuminuria in a few weeks. This child, says Bradley, had not had scarlatina. Bradley also remarks that he found albumen in the urine of two out of twenty patients with inherited syphilis whom he had examined, and it is well known by autopsical evidence, that syphilis of the kidney is much more common in inherited than in acquired syphilis. The diffuse parenchymatous form is most often met with in inherited disease.

Syphilis of the ureter does not seem to occur. Syphilis appears also to spare the bladder, except in connection with disease of the spinal cord.

SYPHILIS OF THE GENITAL SYSTEM IN THE MALE.

The penis most often bears the brunt of the attack in primary syphilis in being the seat of chancre and lymphangitis. Later in secondary disease, cutaneous eruptions occur upon it, and mucous patches and ulcers within the cavity of the prepuce and (very rarely) within the urethra. In tertiary disease, ulcerated subpreputial gumma is by no means rare; a papular eruption may occur within the urethra, giving rise to a gleet. I have observed once such a case. The lumpiness in the urethra could be felt, and it, with the gleet, disappeared promptly under antisyphilitic medication by the mouth.

Finally, in tertiary disease, gummata occasionally occur in the corpora cavernosa, usually in the anterior third of the organ; they are very rare, and must be distinguished from chronic circumscribed inflammation of

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[1] Vierteljahresschrift f. Derm. u. Syph., No. II., p. 35.
[2] British Medical Journal, 1871, Vol. I., p. 117.

the sheaths of the corpora cavernosa[1] and from calcification of the penis.

Gumma of the corpus cavernosum is a hard, painless, semi-elastic swelling at first. It causes deflection of the penis when erect, toward the side upon which it is situated, and to an extent proportionate to the size of the growth. In structure it is like other gummata. It goes on to reach a certain size, and then may soften and shrivel away, or become fibrous, or possibly calcify. I do not know of any case personally where a gumma of the corpus cavernosum has softened and discharged externally. General calcification of the penis occurs in plates upon the sheath of the corpus cavernosum. It is apt to be general, and is not of syphilitic nature.

Chronic circumscribed inflammation of the corpora cavernosa is also mainly superficial, confined to the sheath and underlying tissue, painful (somewhat) to pressure, often advancing in one direction as it gets well in the other, never by any chance suppurating, occurring spontaneously or as a result of injury, never due to syphilis.

The last two affections are not in the least degree helped by anti-syphilitic treatment, either mercurial or by the iodides; but gummy tumor promptly disappears when the latter remedy is boldly pushed in large doses.

The prostate does not appear to suffer directly from syphilis. Gumma in this region is possible, but very rare.

The spermatic cord is sometimes the seat of gummy tumor, and the scrotum a favorite locality for condylomata and scaly patches of the circinate sort.

SYPHILIS OF THE TESTICLE.

Four different affections attest the action of syphilis upon the testicle:

1. Epididymitis.
2. Diffuse orchitis.
3. Gummy tumor.
4. Functional impotence.

They may all be arrested and cured by appropriate treatment.

SYPHILITIC EPIDIDYMITIS.

During secondary syphilis, in the earlier months—three or four after chancre (Dron)—there may appear in the epididymis, usually at its head, on one or both sides of the body, a round, hard tumor, standing distinct from the testicle, and not capped over it as in ordinary chronic epididymitis. The lump varies in size, but generally gets to be as large as a good-sized marble. It is attended by a slight amount of spontaneous pain, increased by manipulation; occasionally the swelling is perfectly indolent, and the pain is never so great as that experienced in ordinary epididymitis.

Nothing more is known of the affection than this. I have encountered it only two or three times. It is quite rare. It always gets well, never has been known to soften, and no autopsy has been reported. It is quite constant in its appearance at the globus major, and does not extend to

[1] Van Buren and Keyes: Gen. Urinary Diseases and Syphilis. N. Y., 1874, p. 24.

the body of the epididymis, or to the globus minor. It never involves the testicle. Rollet places the outside limit of its existence at two months from its first appearance.

Treatment is mercurial. No variation is required from that in use for the stage of syphilis in which the affection occurs. Local measures are unnecessary. The patient need not alarm himself about the lump. Unlike the chronic thickenings left in the body and tail of the epididymis after gonorrhœal epididymitis, the syphilitic form does not occupy the calibre of the tubes, or occlude them by pressure, as proved by Dron, who found spermatozoa in the semen of a patient, both of whose testicles were the seat of this affection.

SYPHILITIC ORCHITIS.

In the tunica albuginea, and in the fibrous septa running between the clusters of seminal tubules, usually commencing at the circumference, perhaps generalized through the whole parenchyma, sometimes confined to a limited area, a cellular overgrowth of the connective-tissue elements may arise due to syphilis, constituting diffuse syphilitic orchitis.

This new tissue develops until it has reached a certain limit, and then contracts upon itself, squeezing the secreting elements of the testicle, and finally reducing the whole gland to a fibrous cicatricial nodule of small size, or producing depressions and seams which mark the limited areas of disease and distort the gland more or less. Along with the other changes in the organ the tunica vaginalis becomes thickened, and its cavity obliterated by cohesion of its two surfaces, or cut up into partitions by partial adhesions.

The result of the anatomical changes is a gradual, general enlargement of the organ or a localized patch of induration, usually the former. After a time the organ atrophies, with or without treatment, and gets to be a mere fibrous knot, or, in any case, smaller than it originally was. Suppuration never occurs.

Syphilitic orchitis is a late symptom, rarely appearing during the first year of the disease, and sometimes coming on long after all symptoms have ceased. It is occasionally found in inherited syphilis.

The symptoms are an insidious swelling of one or both testicles without pain. Generally the patient finds out by accident that one of his testicles is unnaturally large and hard. Squeezing such a testicle in the hand causes the patient little or no pain, and the organ feels to the hand as hard as wood. It preserves its oval shape—the epididymis is indistinguishable from the body of the testicle—the cord is not involved, the tunica vaginalis, instead of being obliterated, may be full of fluid.

GUMMY TUMOR OF THE TESTICLE.

Gumma of the testis is less common than diffuse orchitis. With gumma there is generally, also, more or less fibrous thickening. Small gummata are generally scattered through the morbid fibrous tissues of the organ—large ones surrounded by condensed fibrous tissue, like a capsule. The gumma is at first purely cellular; finally it is found as a fine, fibrous felt-[illegible] e seat of amorphous granulo-fatty degeneration. In the cheesy [illegible]lates of cholesterine are sometimes found (Virchow).

The gumma is recognized as a distinct tumor perhaps accompanying the physical changes indicative of diffuse orchitis. It is painless. The nodule grows to a certain size, then softens centrally and undergoes cheesy degeneration, or, infiltrating the tunica albuginea, the two surfaces of the tunica vaginalis adhere, and the skin becomes attached over the swelling mass. Finally the skin softens, ulcerates, and lets out the gumma, which bears with it the contents of the testicle, the whole mass protruding outside and constituting one form of benign fungus of the testicle. This fungus grows larger on account of an increased formation of gummy material within the tunica albuginea, the surface of the protruded portion becomes covered with granulations and bathed in a scanty pus. The yellow, degenerated, gummatous matter is found lying between clusters and coils of seminal tubules, which may be carelessly pulled out by the unwary practitioner under the idea that they are dead, sloughy, and of no service. The tissues of the scrotum contract around the base of the fungus, making it pedunculated. The whole mass is hard, insensitive, not bleeding easily.

If the affection be not arrested by treatment, its natural termination is to go on until the whole of the contents of the tunica albuginea have been extruded, after which the mass dries down and puckers, leaving the wasted stump of the testicle attached to the cicatrix in the scrotum.

The epididymis is sometimes the seat of gummy tumor, but rarely; and the cord (Verneuil) also occasionally.

The symptoms of syphilitic testicle, besides the changes of form already described for the diffuse and gummatous form, are: diminution or absence of sexual desire, and often entire absence of erections.

The diagnosis of syphilitic testicle is often difficult. There is no possible danger of mistaking it for gonorrhœal epididymitis, or any other acute inflammatory affection of the epididymis or testicle; the intense pain in these maladies, both spontaneously and upon handling the organ, excludes syphilitic testis from diagnostic consideration when it is in question. Nor is there any considerable chance of the error of mistaking chronic epididymitis, the pseudo-tubercular testis, for syphilitic disease of the organ. The lumpy condition of the epididymis capping the soft testicle above, or hanging down as a cheesy nodule below the tail of the epididymis, perhaps softening into abscess and becoming fistulous, but leaving the soft, elastic testicle intact in its peculiar natural sensibility; this chronic malady has nothing in common with syphilitic testicle, and, although it may occasionally suggest the syphilitic epididymitis of Dron, yet its chronic course and peculiar pathological physiognomy will readily distinguish it from the more innocent syphilitic affection.

It is still insisted upon by Curling and others that there is a simple inflammatory orchitis, a sarcocele, which is neither tubercular nor syphilitic. This is possible, but exceptionally rare. I have occasionally encountered a case clinically where no other diagnosis but this seemed possible, yet it is a good rule to adopt Sir Astley Cooper's method and never to cut out an inflamed testicle until mercury has had a full chance; and, it may be added, the iodide of potassium as well. A benign fungus has also been described, but it is much more uncommon than syphilitic fungus.

The main difficulties in diagnosis of syphilitic testicle, however, are hydrocele, tubercle, cancer, and sarcoma of the testicle. Hydrocele is not important. Many syphilitic testicles are so surrounded by the fluid of a hydrocele that their physical characters are entirely obscured. In no case is it safe to decide that a hydrocele is a simple matter until it has been

tapped and the testicle examined. If, after tapping, the physical signs are those of syphilis of the testicle, no radical treatment of the effusion in the tunica vaginalis should be undertaken; both because it is likely to fail, and because it is unnecessary, since antisyphilitic treatment will remove the effusion together with the lesion of the testicle.

Tubercular testis, however, is often painless; and certain stages of cancer of the testicle and of sarcoma are suggestive of syphilis. The salient points of clinical difference between these affections can be best presented in the form of a short diagnostic table.

Diagnostic Table.

SYPHILITIC TESTICLE.	TUBERCULAR TESTICLE.	CANCEROUS TESTICLE.	SARCOMATOUS TESTICLE.
1. *Date of appearance generally.*—Middle age.	Adolescence.	Youth.	Youth.
2. *Size.*—Rarely larger than a goose-egg.	Often larger than a goose-egg.	Sometimes enormous, weighing several pounds.	Often very large, but generally becoming cancerous when it attains great size.
3. *Commencement.*—Generally in the epididymis.	Generally in the testicle.	Always in the testicle.	Always in the testicle.
4. *Growth.*—Insidious, often unnoticed, may last several years.	Slow; often lasts many years.	Rapid; average about two years.	Slow at first, often rapid later on; total duration many years.
5. *Physiognomy.*—Smooth and even throughout, or containing one or more nodules in the testicle; scrotum unchanged.	Nodular, occupying the epididymis; scrotum often reddened and hot.	Unevenly lobulated in various directions; veins of scrotum often enlarged, integument unchanged.	Generally even, or slightly lobulated; scrotum unchanged.
6. *Induration.*—Very strongly marked, woody.	Not marked, the feel is elastic.	The lobules present different degrees of hardness; some of them seem to fluctuate.	Solid, meaty feel, not very hard; there may be a cyst which fluctuates.
7. *Spontaneous pain.*—Absent.	Insignificant, as a rule.	Present in paroxysms, often very sharp.	Absent.
8. *Pain on handling.*—Generally absent; normal sensibility gone.	Generally absent; normal sensibility gone.	Pain increased by handling; no natural testicular sensation.	Absent; normal sensibility gone.
9. *Fluid in tunica vaginalis.*—Common.	Not unusual.	In small amount.	Usually absent.
10. *Softening and discharge.*—Rather exceptional; sometimes occurs, leaving fungus.	Softening and abscess the rule, leaving fistula.	Rather common, leaving malignant fungus.	Does not occur.
11. *Often bilateral,* simultaneously or consecutively.	Often bilateral consecutively.	Very rarely bilateral.	Hardly ever bilateral.
12. *Sexual power.*—Diminished or absent.	Sometimes diminished, often not impaired.	Not impaired, except by size and pain.	Not impaired.
13. *Fungus* found sometimes, of small growth, pale, not bleeding easily.	Abscess and fistula found, but not fungus, except in the shape of simple granulations.	Fungus found sometimes growing rapidly, livid in color, bleeding very easily.	No fungus.
13. *Inguina and pelvic glands.*—Normal.	Normal or tender from simple inflammation.	Enlarged cancerous.	Not involved while the tumor remains benign.
14. *Spermatic cord.*—Rarely implicated.	Generally involved after a time.	Often implicated toward the end.	Always normal.
15. *Seminal vesicles.*—Normal.	Frequently diseased.	Normal.	Normal.
16. *Treatment.*—Promptly satisfactory in case of gummy tumor; often very slow in its effects, if the malady has already existed for some time in the diffuse form; treatment necessary to save testicle from atrophy, which can always be accomplished when treatment is commenced in time.	Quite unsatisfactory; cure possible, but very slow, if accomplished at all; general tuberculization quite apt to come on and terminate the case; castration is often justifiable.	Prompt castration is necessary, and affords the only hope of saving the patient's life.	Prompt castration desirable to prevent the testicle from becoming cancerous, since sarcoma in this region often runs into cancer.

Treatment.—Syphilitic testicle in the diffuse form calls for mercury as well as the iodide of potassium. Local treatment is of little or no value, but a suspensory bandage should be used to protect the enlarged organs from injury. Mercury may be employed by general inunction. Local inunction of the scrotum, or the wearing of plasters upon it, is dirty, and possesses no superior merit. The effect of treatment is slow, but it should be persisted in to save whatever of the glandular structure is possible from atrophy. The iodide should be pushed up to large doses (twenty grains or thereabouts), and the effect watched. If a return of sexual appetite and a reduction in the size of the gland are not quite noticeable within a month, it is better, for the stomach's sake, to reduce the dose of the iodide to five, or, at most, ten grains, and push the mercurial by inunction until the mouth is mildly touched. After this the dose of the mercurial may be also diminished, and pressure of the testicle (by strapping) combined with a moderate internal mixed treatment.

For gummy tumor, the iodides alone are needed, in doses as large as the stomach can conveniently manage. A prompt effect is to be expected.

Fungus of the testicle should on no account be molested by local treatment. If it becomes strangulated and threatened with gangrene, it is proper to liberate the neck of the fungus from its pressure by suitable incisions through the skin, dartos, and albuginea. Otherwise the fungus must be left alone, covered by a piece of lint smeared with vaseline, to protect it from friction and injury. The iodide of potassium, given in sufficient doses, will soon cause the gummatous deposit within the tunica albuginea to be absorbed, and all the seminal tubules within the fungus, which have escaped destruction by pressure, will be naturally drawn back within the cavity of the testicle. Toward the end, a little pressure may hasten the disappearance of the fungus and the cicatrization of the wound.

FUNCTIONAL IMPOTENCE.

Syphilis may cause functional impotence, not due to any physical lesion of the testicles. In the tertiary stage, impotence may come on independently of any cachexia, the testicles appearing normal in size, and possessed of their peculiar sensibility, but perhaps feeling a little flabby, as if less full of blood than usual; under these circumstances, the patient may lose all sexual desire, and absolutely all power of erection.

This condition is certainly due to some impression upon the nervous system. There is a very positive bloodlessness of the penis and testicles. Treatment often restores power, and then the organs regain their plumpness. The affection is not due, as has been claimed, to the use of the iodides, or to any wasting influence their prolonged use exercises upon glandular structure. Patients have this form of impotence, who have never taken the iodides—patients whose symptoms have all been controlled by mercurials. Moreover, the iodides, internally, constitute the best treatment for the malady.

One reason why the iodides have been accused of causing atrophy of the testicles is, doubtless, because, in many cases of advanced gummatous orchitis, the iodides produce at first a diminution of the enlarged testicle, and, during the continuance of the medicine, the gland atrophies away to a stump. The iodides are now accused of this catastrophe, whereas the

truth is that all the secreting structure of the testis was already destroyed, and replaced by newly formed tissue before treatment was commenced. The atrophy was inevitable. Truly, its appearance was hastened by the iodides, but not caused by them; and the trouble was that treatment was commenced too late to save an organ already pathologically doomed to destruction.

There is no special diagnostic feature which distinguishes functional impotence, due to syphilis, from the same affection dependent upon other causes (generally, moral; sometimes, gouty); but, when a patient, having formerly had syphilis, complains of failing sexual appetite and power, it is always allowable to suspect that the influence of the old disease upon the nerves regulating the sexual sense is the cause of the trouble, and the prognosis at once becomes proportionately less severe than it would have been had no former syphilis existed.

Treatment.—The best treatment for functional syphilitic impotence is mixed internal medication in reasonably mild form, persistently pushed. The effect of treatment is slow, but often very manifest. A perfect cure is possible. Other measures, such as tonics, change of air, general frictions to the whole surface of the body, shower-baths, etc., may be used, but they hold a place second to that occupied by antisyphilitic treatment.

I have encountered a number of these cases, totally disconnected with pathological tissue-changes in the testicles, and am confident that the affection exists as a special malady, and that it is curable by antisyphilitic treatment.

SYPHILIS OF THE GENITAL SYSTEM IN THE FEMALE.

The female genitals are the common seat of chancre, erosions, and mucous patches. Tertiary tubercular patches are found within the vagina, and tertiary brawny infiltrations, leading to ulcers which are very chronic in their course. Gummata in this region may perforate one or the other of the vaginal septa. Excepting from possible mucous patches in its cavity, the unimpregnated uterus does not appear to suffer from syphilis. Lancereaux describes a case of gummy tumor of the ovary similar to the same lesion in the testicle, and both he and Hutchinson have encountered some cases of imperfect sexual development in the female, in connection with congenital syphilis, making it seem probable that parenchymatous ovaritis is possible in hereditary syphilis, as parenchymatous orchitis and gumma of the testicle in the male are known to be.

Gummata have been found in the Fallopian tubes.

Functional derangements of menstruation are very common in women with syphilis. In the secondary stage, anæmia leads to scanty menstruation, the relaxed ligaments allow the organ to become easily displaced. Hence arise all sorts of malpositions with catarrhal states of the uterine cavity, painful menstruation, sterility, hysteria, etc., due to general causes rather than the specific action of syphilis. Metrorrhagia may also come on—by what mechanism does not seem evident.

The cachectic stage of tertiary syphilis also leads to uterine derangements and induces a premature change of life.

Treatment of these uterine derangements is that of the stage of syphilis in which they occur, together with such local measures as each individual case may call for.

THE EFFECT OF SYPHILIS UPON PREGNANCY.

When a woman is in active syphilis, she rarely carries a child to term. At first it is customary for such a woman to abort at or about the third month of utero-gestation. Such a woman may have been poisoned by her husband, and had a chancre without knowing it. Her sore throat may have been transient, her first eruption so light as not to have attracted attention; but she finds her color fading, her hair growing dry and falling out, her scalp getting scurfy, her face wearing a pinched and wearied expression. She is evidently anæmic; she feels languid, listless, incapable of undertaking anything, and at the present day, since the fashion so goes, she generally passes for being malarial.

Such a woman, without any obvious signs of syphilis about her, does not thrive upon any regimen, or tonic course, or quinine, or change of air, so well as she does upon a combination of blue mass and dried sulphate of iron, or a mild dose of corrosive chloride of mercury in compound tincture of bark. Such a tonic suits her. The mercurial element always brightens her up, and sends the blood again to her faded cheeks.

A woman under these circumstances will usually abort. Should she become pregnant again, she will again abort, but probably at a later month of utero-gestation. Again pregnant, she again aborts; on this occasion, perhaps, miscarrying at the seventh month. The next attempt may produce a dead-born child, with its skin commencing to come off. Finally a child will be born at term alive, perhaps plump and clean-skinned, but in from two to four weeks it begins to fall away in flesh, gets snuffles, sore mouth, eruptions, jaundice, and dies; another child appears and dies in a convulsion after a few months of life, or perishes by marasmus in its second summer. At last a fat child is born seemingly healthy, but, as it grows, its fontanelles close too rapidly, it is microcephalic, looks like an old man, is perhaps very precocious, but it has a harsh cry, contracted jaws, bad teeth; the second set are syphilitic teeth. It has a syphilitic countenance, and grows up, perhaps, dwarfed or deformed in its bones, to fall a victim, possibly, to gummatous lesions of the bones, the brain, the eye, or the viscera during development into manhood.

After this the mother will produce a perfectly healthy child, if her own health be good. Her subsequent offspring will not probably be deformed. They will not be strumous. There is no change of type by transmitted inheritance. A child may be weakly, if the mother or father, or both, be in poor health, or from a variety of causes; but if the parent is syphilitic, the child is either syphilitic or healthy, so far as the syphilis essentially has anything to do with the matter.

Now, during all this time above detailed, a mercurial treatment given to the mother, by inunction, or internally, during the whole course, or the greater part of her pregnancy, will generally cause her to produce a healthy child—a child who not only is healthy at birth, but remains healthy, and does not require treatment. Treatment rarely has so good an effect if used in the first pregnancy. Then the syphilitic poison is too strong. A live child may be born reasonably healthy, but its health is not assured, and it may demand treatment to preserve it from injury by the development of hereditary syphilis.

Again, if a mother has produced a healthy child under treatment, she must go on, and at her next pregnancy again take a full mercurial course, although she may have had no symptoms of syphilis during a number of

years, or she will run the risk of again producing a diseased child. During how many pregnancies this must be kept up is not known, but cases are on record where the successful production, under mercury, of two healthy children successively (the eighth and ninth, all the previous children having died syphilitic), did not succeed in rendering the mother capable of bringing a non-syphilitic child into the world.[1] In cases of this sort, therefore, it will be wiser to medicate the mother at least through three successive pregnancies before allowing her to try the experiment of passing through a term of utero-gestation unaided by drugs.

CAUSE OF ABORTION IN SYPHILIS.

Exactly what it is that causes abortion and premature delivery so often when the parents are syphilitic, is not certainly known. Disease and death of the fœtus does not necessarily bring on premature delivery, for a dead child is often carried to term. If the germ is so blighted that its development into a fœtus is impossible, abortion, perhaps, is natural; but the main trouble seems often to lie in the placenta. The question whether syphilitic uterine disease is a prime factor in causing the placental changes, or whether the latter owe their origin to a blighted ovum, does not appear to have been clearly decided. Finally, whether the placental changes have in them anything which can be called specific, or whether they are such as may occur in other morbid states, not syphilitic, is also undecided.

The syphilitic placenta, as described by Fraenkel, of Breslau,[2] under the name of disfiguring granulation-cell disease, consists in a multiplication of the cellular elements of the villi and of their epithelial coating, together with an increase of thickness in the vessel-walls. By this process, which Fraenkel thinks goes on centrifugally from the vessel, the villi increase in size, then the vessels become occluded, and, finally, the villi atrophy. The unaffected villi become congested, extravasations of blood take place, and the fœtus suffocates, because its blood cannot be aërated in the diseased placenta.

This occurs, Fraenkel thinks, when the origin of the disease in the fœtus is syphilis of the father. When the mother is the source of the transmitted syphilis, the maternal placenta is diseased, there is an increased growth of connective tissue in the framework of the placental decidua, hypertrophy of the cells of the decidua, and atrophy of the villi by compression.

The syphilitic nature of the foregoing changes is denied by Lawson Tait,[3] who believes that the same lesions may be due to causes other than syphilis.

Fatty and amyloid degeneration of the placenta has been considered to be dependent upon syphilis, and a cause of miscarriage, and tumors resembling gummata have been observed in the placenta; but the truth is, that this field is not yet thoroughly worked out, and we simply know, clinically, that the placenta is often abnormal histologically, and that the

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[1] Thurman's case: Journ. de méd. et de chir. Toulouse, Oct., 1851.

[2] Ueber Placentarsyphilis: Archiv f. Gynaekologie, Vol. V., 1873, p. 45. These views, given by Angus Macdonald, may be found in the American reprint of Obstetrical Journal of Great Britain and Ireland, October, 1875, p. 472.

[3] *Transactions* London Obstetrical Society. London, 1876, p. 326.

product of conception, itself more or less diseased, is often thrown off before term.

Treatment.—The condition of affairs described above may certainly be averted by treatment. Mercurial treatment is of the most value. The iodides have little or no power in averting the tendency of syphilitic women to miscarry. Mercury will generally do this, and when it accomplishes the result, it does so without injury to either the child or to the mother.

The manner of giving mercury, under these circumstance, is unimportant, provided enough is given. Inunction is highly praised by some authorities. The objection to inunction is, that it is dirty, not suitable to the sex, and that it is difficult to grade the dose accurately, according to the necessities of the patient. A given amount of mercury does not affect all people in a similar way. Some patients have a boundless tolerance of it, while others become salivated with great facility. In the pregnant state there are no symptoms to be guided by, and the value of the mercurial course can only be decided at the end of pregnancy, when it is too late to increase the dose if it has not proved efficient.

Consequently it is best to have some rule for guidance. The method I have adopted is the following: I use an unirritating form of mercury combined with a tonic—such as

℞. Pil. hydrargyri..... gr. c.
Ferri sulph. exsiccat..... gr. l.
M. Ft. pil. l.

Or—

℞. Pil. hydrarg..... gr. c.
Quinine bisulph..... gr. l.
M. Ft. pil. l.

Commencing at the beginning of pregnancy, one of these pills is to be used after each meal (three a day) for a week. Then four pills a day are used for a week, then five pills a day for a week, and so on until the medicine begins to disagree. When the mouth becomes a little touched, all medication is suspended for a week, and then a dose, two-thirds of what was found necessary to touch the mouth, is commenced with and given regularly. It may be alternated, from time to time, with a mild dose of corrosive sublimate in compound tincture of bark. It may be intermitted entirely for a time, and replaced by inunctions of the oleate of mercury or of mercurial ointment, to let the stomach rest—a drachm being used of the oleate (ten per cent. squibb) daily, or less, and after a short time the internal medication being resumed.

If the stomach becomes irritated by the prolonged use of mercury, inunctions must be relied upon in quantity regulated by the tolerance of the patient. If the prolonged use of a mild dose internally keeps the mouth tender, the hygiene of the mouth must be attended to, alkaline mouth washes used, and the tartar carefully removed from the teeth. If the bowels show irritability, bismuth and catechu, with an unirritating diet, must be combined with the mercurial.

Such a course will save most mothers from miscarrying. The chances of averting the mishap are greater the farther removed the conception is from the chancre. Success or failure in one pregnancy must modify the treatment of the next, and the result is certain to be finally satisfactory to all concerned.

Parents who have lost one or two children by miscarriage through syphilis become very despondent, and the mother often needs considerable encouragement to induce her to do anything for a given pregnancy, if former trials have failed.

There is no objection to continuing the mercurial treatment up to the date of delivery, diminishing the dose during the last month, since, presumably, if the child has gone well so far it will take less to hold it. Sigmund thinks the mercury should be stopped with the seventh month, but there does not appear to be any good reason for such a course. Milk diet, combined with the mercurial, is very advantageous in pregnancy, and in any case a mild diuretic should be occasionally used.

SYPHILIS OF THE MAMMARY GLAND.

Mention has been made of the possible chancres about the nipples, and the mucous patches, and ulcers, and lesions upon the skin covering the female breast. The gland itself is attacked sometimes by syphilis. Two forms of the affection have been observed—a diffuse mastitis, and a gummatous infiltration.

Diffuse syphilitic mastitis is very rare. It has only been observed apparently in the secondary period of the disease, and is encountered in the male as well as in the female (Ambrosoli). The gland simply gets swollen and tense, slightly painful. There is no change in the integument, which does not adhere to the underlying tissues. No special treatment is necessary. The swelling always goes down without leaving any trace behind.

The gumma of the breast is a very hard swelling occurring on one or both sides without pain. It goes on to involve the skin, softens and discharges. It is very often mistaken for cancer. History and concomitant lesions make the diagnosis, and the iodides in large doses effect a cure. Gumma of the breast has been observed in connection with inherited syphilis.

CHAPTER XIV.

SYPHILIS OF THE EYE AND EAR.

Syphilis of the Eyelids and Conjunctiva.—Syphilis of the Cornea, the Iris (Plastic and Gummatous Iritis).—Syphilis of the Vitreous, of the Ciliary Body, of the Choroid, of the Retina (Atrophy of the Retina, Retinitis Pigmentosa).—Syphilitic Optic Neuritis.—Syphilis of the Ear.—Syphilis of the Outer Ear and Auditory Canal.—Plastic Myringitis.—Syphilis of the Auditory Nerve.—Syphilis of the Middle Ear.—Ear Affections found in Inherited Syphilis.—Catarrhal Inflammation of the Middle Ear, Deaf-mutism.

THE skin of the eyelids is occasionally the seat of chancre; patches of various kinds of eruption may come upon it, and mucous, flat papules are not uncommon. The tarsal borders may be uniformly thickened in late syphilis, and little circumscribed gummata, looking like styes, but more livid and painless, are quite common in this region during the course of the malady.

Upon the conjunctiva, chancre and mucous patches have been observed. I have seen a case of indurated chancre of the caruncle in a female, which had been excised on account of a diagnosis of epithelioma, but induration recurred in the cicatrix, and general syphilis followed. Gummy tumors of this region (the lachrymal caruncle) is quite a serious affection in appearance. Dr. R. W. Taylor, of this city, has reported[1] two excellent cases, one of which had been excised for cancer, but, returning, was cured by iodide of potassium.

The lachrymal sac, and the skin over it, may be the seat of gummatous deposit, and if this be allowed to ulcerate, lachrymal fistula may result. The nasal duct is frequently occluded by reason of ulcerative gummatous changes of mucous membrane and bone within the nasal cavity, especially if the lachrymal bone be involved in necrosis.

Changes in the cornea are very uncommon in connection with acquired syphilis. With inherited disease chronic interstitial keratitis (Hutchinson) is quite common. It will be described, along with the other lesions of inherited syphilis, in Chapter XV. I have seen one well-marked case of chronic interstitial keratitis due to acquired syphilis in an adult. This patient got slowly but perfectly well under a mixed treatment.

The iris suffers very often in acquired syphilis. Mydriasis and myosis have been described in connection with the affections of special nerves due to syphilis.

Iritis.—It is probable that, at least, half of all the cases of iritis which occur are syphilitic in origin. Iritis most often comes on in severe cases of syphilis with one of the early eruptions; particularly is it apt to coincide with a pustular eruption. The symptoms are exactly the same as those of acute iritis due to any cause; slight dulness and change in the color of the iris, more or less injection of the peri-corneal conjunctiva

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[1] New York Medical Record, March, 1875.

(possibly chemosis), lachrymation, supra-orbital pain, generally worse at night, and intense photophobia. The pupil is hazy, and will not dilate in the dark. When forced to dilate by the use of atropia or duboisia, its margin is often festooned, it does not dilate regularly. Plastic exudation of lymph is quite common, effused from the borders and posterior surface of the iris by means of which adhesions are effected with the anterior capsule of the lens, and the dilatability of the pupil permanently compromised. Its opening may be entirely occluded. A thin, diffused plastic exudation sometimes fills the anterior chamber. It may seem to be absorbed and to melt away under treatment.

Gumma of the iris is less common, but may be observed as a small, yellowish red papule growing from the iris. This may reach a considerable size, fill up the pupil, and distend the anterior chamber. It may be seen to disappear under the internal use of the iodide of potassium. Instead of growing out as one distinct tumor, there may be several small gummata upon the iris, or the whole muscle may be diffusely infiltrated, and contract strong adhesions with the capsule of the lens.

The ciliary body and the choroid may be involved in inflammatory and gummatous complications in connection with syphilitic iritis.

Relapse of plastic iritis, especially if there be many adhesions, is quite common, and these relapses may continue on for a number of years, a slight cause, such as over use of the eye, the influence of cold, a very bright light, being sufficient to kindle up an attack. Plastic iritis is often double, simultaneously or consecutively. Gummatous iritis is generally confined to one side.

Treatment.—Iritis generally yields a very prompt obedience to the influence of mercury. The drug may be given in any shape, but it should be pushed until its effects are quite obvious. If the patient is anæmic and debilitated, cod-liver oil, tonics, change of air, good food, etc., are all of the highest value. No care should be spared to put the patient under the best possible dietetic and hygienic surroundings, for an important function is threatened. The mercury should be pushed until the gums show its influence slightly.

The great danger in iritis is adhesion of the pupillary margin to the anterior capsule of the lens. If this occurs, it is vastly better that it should do so with the pupil widely dilated; hence it is always advisable to use instillations of solutions of atropia or duboisia into the eye. A solution of gr. i.—iv. to the ℥ i. of distilled water may be used; a few drops being placed beneath the lid once a day, or oftener, if it is found necessary, in order to hold the pupil dilated to its greatest extent, and this should be continued until all photophobia has passed, and all congestion ceased. If atropine irritates, a solution of duboisia, the new mydriatic, may be used. The eye should be kept closely shaded from light, but it is not wise to keep the patient in the house, much less to confine him to a dark room. Oleate of morphia, or the oleate of morphia with oleate of mercury, may be rubbed over the brow in case of pain—alone, or combined with belladonna ointment.

The gummatous form of iritis comes most readily under the influence of the iodides, but the use of atropia is desirable in these cases as well as in the plastic form. For old cases where the pupil is adherent, and relapses occur, iridectomy is the remedy.

The vitreous body, from degeneration of its cells and proliferative changes, may show opacities caused by syphilis, and capable of removal by treatment.

Cataract may ensue as an indirect result of syphilis due to disease in the choroid, the ciliary body, the iris, and dependent upon opacities in the lens, or its capsule. Anti-syphilitic treatment will not relieve these opacities, and the result of operation for cataract is not always satisfactory, owing to possible damage occasioned by syphilis in the deeper structures of the eye.

Cyclitis has been observed as a result of syphilis and gummata, involving the ciliary body, in severe cases implicating the iris, attended by great pain and calling for extirpation of the globe of the eye.

The choroid may be affected by syphilis alone, or in connection with disease in other structures within the globe; it often participates in inflammatory disturbances which primarily involve the iris. Syphilis does not seem to produce changes in the choroid which are pathognomonic. Choroiditis disseminata, described by Graefe, is a common form of the disease as produced by syphilis. In this condition the ophthalmoscope reveals, through a clouded vitreous humor, small scattered spots of a pale color, perhaps with reddened borders scattered over the posterior surface of the chamber of the eye. The retinal vessels may be occasionally seen unchanged, passing over these spots, which are of varied size, but never large, and are evidently elevated exudations. The optic nerve is congested.

These elevated exudations may disappear entirely under treatment, leaving but little trace, or they may be succeeded by small white atrophic spots, without pigment, except at their borders, where there is an intensification of pigmentation in the shape of a dark line. The vitreous is more or less clouded with opacities.

This disease is very chronic in character, not attended by any important symptoms, so far as the general health is concerned. The amount of influence upon vision is proportionate to the position and extent of the exudative patches, and the degree of atrophy following them. The course of the malady is very chronic; it occurs in late secondary disease, and well along in the tertiary period. Mercurial treatment is appropriate, and, unquestionably, is often slowly effective of much good. In old cases, where atrophy is an accomplished fact, or far advanced, treatment is of little or no value. Local treatment is useless. The eyes should be kept protected from strong light.

The retina also suffers from syphilis. Both eyes may be attacked simultaneously or (most often) successively. The duration of retinitis is variable; sometimes it lasts but a few weeks, but, more often, is chronic, lasting several months. There is no outside redness upon the conjunctiva, no lachrymation, no pain, moderate photophobia. The only subjective symptoms are, in the beginning, flashes of light; later, failure of sight. The affection may get well, and leave little or no trace, or may lead to permanent impairment of vision.

The ophthalmoscope reveals a cloudy vitreous, and a retina apparently obscured. Its outlines are less distinct than usual, the retina is œdematous, the retinal vessels are hyperæmic, as well as the optic nerve; the outline of the papilla is not clearly marked. The veins are full, and there may be hæmorrhages.

There is a form of syphilitic retinitis, which Virchow has called recurring central retinitis, due to syphilis, in which the changes are pretty closely confined to the neighborhood of the yellow spot. The malady passes off, and returns, perhaps, several times.

In connection with atrophy of the optic nerve, attending syphilitic

lesions within the calvarium, the retina may also atrophy. Central vision then gradually disappears, and defects of vision become evident in other parts of the field. Hughlings Jackson has pointed out that there may be evidence of considerable engorgement of the papilla, by the ophthalmoscope, for some time before vision begins to fail in these cases.

Retinitis pigmentosa has been ranked, by Hutchinson and a number of authors, among the changes of the eye prevailing in inherited syphilis. As described, it appears that the pigment spots are scattered irregularly over the fundus of the eye; the choroid is involved, amaurosis comes on early, and the progress of the affection is rapid (Swanzy).[1]

The treatment of syphilitic retinitis is by mercurials in moderate amount. No great energy of treatment is called for, and a cure may be expected, if treatment is applied during the early stages of the malady. Locally, the eyes should be shaded by colored glasses. The abstraction of blood, by occasional leeching of the temple, has been recommended.

Optic neuritis is an affection very common in syphilis, in connection with a variety of lesions of the brain. It may also originate primarily within the globe of the eye, independently of external causes. It is very often found in connection with convulsive and paralytic changes, due to syphilis, and is looked upon as a corroborative symptom of great value in many cases.

The symptoms are: diminution of the field of vision, in one direction or another, often irregularly—a portion, perhaps an irregular half or a quarter of the field, being lost. J. Hughlings Jackson[2] has published a case of intra-cranial syphilis, where double optic neuritis, due to cerebral gumma, was not attended by any evidence of impairment of vision. He therefore insists upon a routine examination of the eyes, with the ophthalmoscope, in all cases of nervous disease due to syphilis, especially if there be pain in the head, in order that impending optic neuritis may be detected early, and loss of sight warded off.

In simple, light cases of optic neuritis, the ophthalmoscope shows only a little indistinct blurring of the papilla, a congestion of the nerve, and distention of the central vessels. In severer cases, the disk is greatly swollen, with irregular, obscured borders. The disk seems infiltrated, and is of a cloudy white, or grayish red color, the vessels distended, irregular, tortuous. This appearance is known as "choked disk." It indicates intra-cranial pressure, as by a tumor, and is only a syphilitic symptom by coincidence. It occurs equally well in connection with tumors of the brain due to other causes. Optic neuritis is oftener double than single.

The treatment of optic neuritis is the mixed treatment of tertiary syphilis with preponderance of the iodides. Local measures are unnecessary. The effect of treatment often depends upon the promptness with which it is commenced, and its power to remove the intra-cranial lesion, which has given rise to the trouble in the eye. The eye-symptoms are often of only secondary importance; but improvement in the size of the field of vision, and an arrest in the progress of the affection may be often attained by suitable treatment persisted in for a considerable time.

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[1] Dublin Quarterly Journal, Vol. LI, 1861, p. 294.
[2] Journal of Mental Sciences, July, 1874.

SYPHILIS OF THE EAR.

The ear suffers in various ways by syphilis. Ulcerative and bony lesions within the cavity of the nose and the pharynx lead to thickening and inflammatory changes in the Eustachian tube and its mucous lining. These may terminate in catarrhal troubles of the middle ear, and consequent impairment of hearing.

The external ear is the seat of many cutaneous lesions and ulcers in syphilis; mucous patches appear sometimes in the external auditory canal, and a peculiar dry scaliness of this canal, with tendency to impaction of cerumen, is quite commonly encountered in syphilitic patients. This affection calls for constant care and frequent syringing of the ear to keep the passage in good order and the drum-head clear until the tendency to dry exfoliation passes away. Improving health, when the depressing influence of syphilis has been removed, restores the integument of the auditory canal to its normal condition.

There is an inflammatory condition of the middle ear due to syphilis which is not a catarrh. No suppuration occurs, but a thickening of the drum-head and of the tissues within the middle ear leading to a restraint in the movements of the ossicula. It is a sort of plastic myringitis. Schwartze and Roosa believe that this condition originates in a periostitis of the middle ear. There may or may not be pain as a subjective condition in this affection. The hearing is always more or less impaired.

The treatment of this affection consists in the employment of warm syringing, the application of leeches behind the ear, inflation of the tympanic cavity, and the use of laxatives and diuretics. The mercurials internally are generally more effective than the iodides; but the possibility of implication of bone calls for the use of the last-mentioned remedy, although not in very large doses.

The auditory nerve, the second branch of the seventh pair, is sometimes the seat of special disease in syphilis, aside from any loss of function due to disease of the bones of the internal ear or gummy tumor involving the nerve. Such essential loss of function in the nerve has been observed in secondary syphilis by Roosa, who found it could be greatly improved by internal treatment. In tertiary disease it sometimes comes on suddenly without warning, not attended by pain, without any especial symptoms except that the patient becomes deaf—often very rapidly so.

If the cochlea is involved, the high notes of the musical scale are lost first (Roosa), or are heard double, and the tuning-fork on the forehead is heard best in the sound ear. Some ringing of the ear is complained of, and vertigo, with staggering, are apt to usher in the disease.

The diagnosis of syphilis, in cases of deafness coming on in this way, must be based upon the history and concomitant symptoms.

The treatment must be energetic. No time is to be lost. The disease should be taken, if possible, at its very beginning, and opposed vigorously with specific remedies from the start. Both mercury and the iodide of potassium should be used, and both should be pushed rapidly. If possible, the mercurial bath should be employed. Two drachms of the black oxide daily in a vapor-bath is not too much for these cases, and the iodide of potassium should be commenced in ten-grain doses, largely diluted in water, after each meal. The quantity should be slightly increased at each dose daily, until the point of tolerance has been reached. Everything in these cases must be made subservient to the treatment. The pa-

tient should give up business; he should have his mind put at rest and be amused as much as possible. He should be confined to an unirritating diet, rice, milk, etc., with bismuth, if necessary, that he may bear his medicine well, and the medicine should be pushed to the point of tolerance; for with this disease certainty in the conviction of a correct diagnosis and vigorous boldness in treatment is half the victory.

In inherited syphilis the ear suffers in two ways. There may arise, in a child with inherited syphilis, a catarrhal condition of the middle ear, which is very obstinate, and likely to result in inflammatory adhesions of the ossicula and permanent impairment of hearing.

Internal mercurial treatment, with cod-liver oil, and plenty of suitable food, constitute the best measures to be employed against this affection, in combination with change of air, syringing of the external and inflation of the internal ear.

Deaf-mutism sometimes occurs in children with inherited syphilis who have been born with perfect capacity for hearing. Jonathan Hutchinson has called attention to a loss of hearing which may come on very suddenly, sometimes quite slowly, in children with inherited disease, after they have begun to talk, but before the age of puberty. This affection is apparently an essentially nervous malady, not attended by any pain. There is no evidence to prove that the lesion is inflammatory. Treatment is of little or no value in these cases, and their pathology is not understood.

CHAPTER XV.

INHERITED SYPHILIS.

Syphilis does not change in Type during Transmission by Inheritance.—The Syphilitic Fœtus.—Bone Syphilis in Inherited Disease.—Inherited Syphilis in the Infant.—Date of Appearance of Symptoms in Inherited Disease.—Pemphigus of Inherited Syphilis.—The Syphilitic Countenance.—Syphilitic and Mercurial Teeth.—Interstitial Keratitis.—General Treatment of Inherited Syphilis.

SYPHILIS may be transmitted by inheritance. The vexed question as to whether the child can derive its disease solely from the father, the mother being sound, has already been discussed (p. 70), as well as the possibility of inheritance in the third generation. There can be no possible doubt that active early syphilis in the mother necessitates disease in the child, if haply the latter come to term at all; while active early syphilis in the father is not incompatible with a healthy child, if the mother be not poisoned. This has been attested by numerous well-observed instances, from a variety of sources. I have witnessed it on two occasions, which do not admit of any doubt in my mind. After syphilis becomes latent in the parents, when they both appear to be healthy, the child may still be syphilitic, and repeated successive conceptions may all yield a diseased product for a number of years, the limit of which cannot be definitely stated for any given case. This much, however, seems certain, that the rule is for syphilis, eventually, to wear itself out, and for syphilitic parents, no matter how protracted their disease, eventually to produce healthy offspring, provided their own health has not been seriously and permanently undermined by syphilitic cachexia or visceral lesions. In other words, syphilis is transmitted only as syphilis. Scrofula is not syphilis. Debility and nervous disease in children is not syphilis. A syphilitic parent may produce a weakly child, because she has had her own health broken by syphilis; but she would have produced exactly the same child, had her health been broken by want and privation, by cancer, by malaria, by alcohol, or any other cause. Syphilis does not change in type by transmission. It does vary greatly, as seen in the child, but it varies in activity, in intensity, not in type. A child born to parents in active syphilis is not apt to live unless its own vitality has been sheltered by the treatment of the mother while it was in the fœtal state. A child born to parents whose disease is on the wane, perhaps nearly exhausted, shows but few evidences of disease, and those perhaps only during adolescence; but what symptoms it does show bear the brand of syphilis, and are relievable, if at all, mainly by antisyphilitic treatment.

Syphilis of the uterus, ovaries, and placenta, has been already considered (p. 226).

THE SYPHILITIC FŒTUS.

When the intensity of syphilis is great enough, the germ is incapable of development to maturity, and the fœtus dies. This death of the product of conception may be attended by and due to alterations in the placenta, or it may have no connection with such changes. The ovum may be blasted to such an extent that abortion of a misshapen organized mass occurs within a few months after conception. The syphilis of the parents, under these circumstances, is too apparent to need confirmation by any fresh proof drawn from any condition of the ovum, and the latter is hopelessly damaged from the start, so that even very active treatment of the mother is powerless often to save it from ruin. Attempts at saving the fœtus must, however, be made at each subsequent pregnancy, and the chances of success will improve very materially with each attempt.

When the child has been fully formed, and then dies in utero, it is very uncommon for the uterus to carry it to full term. The movements of the child cease, and the mother may feel debilitated without being positively sick, or she may retain her usual health. Under these circumstances, even if the death of the fœtus can be proved by a cessation of the heart-sounds, it is best not to interfere with nature. Nothing is to be gained by bringing on premature labor, and no damage likely to ensue by leaving the dead child where it is. The labor is not likely to be unnatural in any respect. The mother should be prepared beforehand for the announcement of the death of her child, and measures be instituted early to suppress the flow of milk.

When a fœtus has been dead in the uterus for some time, it becomes macerated. The epidermis raises into large bullæ over portions of the body, or sheds off entirely in large patches. The amniotic liquid is more or less cloudy, discolored, sometimes putrid. In such children are found invariably certain pathological tissue-changes in the viscera and in the bones, particularly the epiphyseal ends of the long bones. These changes are the same as those which are found (although less marked) in the viscera and bones in children who die of inherited syphilis at varying periods after birth. The visceral changes are much the same as those which occur in connection with some cases of acquired syphilis, the difference being that, with inherited disease, visceral lesions are much more common than in acquired syphilis, and that they are more often of the diffuse interstitial type than gummatous, as distinct tumors. Interstitial hyperplastic thickening of the parenchyma of the liver and lungs is very common in inherited syphilis—so common as to be the rule in all cases dying early. The thymus is quite constantly involved, and the spleen and kidneys very often. The changes in these organs produced by inherited disease have already been considered in connection with the visceral changes produced by acquired syphilis. It is unnecessary, therefore, to repeat them here. The changes in the bones in inherited syphilis, however, have in them enough of special interest to demand a separate description. The ordinary necrotic and carious changes, the subperiosteal gummata, and the ulcers involving the bone, already described for acquired syphilis (p. 183), occur also sometimes in children with inherited disease who survive ; but the lesions now about to be studied are found only in inherited syphilis, and are peculiar to it. They are very constant also, and it is said may always be found upon any dead-born fœtus, if the cause of its death has been syphilis. All children with inherited syphilis do not necessarily suffer with these

bony changes, or at least, if they do, they grow up without bearing any evidence in their bones that they have so suffered ; but, if the syphilis in the inherited state be intense enough to blight the ovum and cause the death of the fœtus, then these bony changes, more or less marked, are constantly found. Parrot states that the changes are constant, and begin in utero, or shortly after birth.

BONE SYPHILIS IN INHERITED DISEASE.

Much has been written of late years upon this all-important subject. Only a sketch of the actual conclusions already reached can be given here for lack of space.[1]

The symptoms of bone syphilis in inherited disease are a thickening at the ends of the long bones, sometimes involving the skin in inflammatory adhesion, sometimes attended by local softening and suppuration, sometimes having gone on to a separation of the epiphysis from the shaft of the bone, and given rise to an inability to use the limb (pseudo-paralysis, Parrot). The bones most often diseased in the order of their relative frequency are the long bones of the extremities, the ribs, the scapula, ilium, cranium, the clavicles, the metacarpal and metatarsal bones, lastly, the vertebræ. The lesions are nearly always symmetrical.

The changes in the bones take place at the line of cartilaginous junction between different centres of ossification, and are most marked at the epiphyseal line of junction at the ends of the shafts of the long bones. Here may be found fusiform swellings thickening the bones and osteophytes, bony overgrowths, which may be felt through the skin. If the degenerative changes have advanced far enough, an epiphysis may be separated from its diaphysis, without any perforation of the skin or discharge of gummatous material ; or, finally, there may be multiple fractures of the bones (rarely), or the skin may become adherent and perforated, allowing the debris of bony and cartilaginous tissue with gummatous material to be discharged externally.

All of these conditions (except the last) may be found in children dead-born, and, any of them, during infantile life, with or without other evidences or of syphilitic disease. They should be sought for in the fœtus dead-born and prematurely delivered, if there be any reason to suspect syphilis in the parents.

Another morbid condition, due to syphilis and described by Parrot, is

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[1] Full information may be obtained by consulting :

Valleix : Bull. de la Soc. Anatom. Paris, 1834, p. 169.
Bargione : Lo Sperimentale, July, 1864.
Wegner : Virchow's Archiv, Vol. L., p. 305.
Waldeyer and Koebner : Virchow's Archiv, Vol. LV., p. 367.
O. Haab : Virchow's Archiv, Vol. LXV., p. 366.
Parrot : Archiv. de physiol. norm. et path., 1872, Nos. 3, 4, and 5 ; and same journal, 1876, No. 2, p. 133 ; also Gaz. des hôp., Sept. 25, 1877, p. 881, and Gaz. méd. de Paris, No. 44, 1873.
Taylor : Bone Syphilis in Children. N. Y., 1875.
Porak : Bull. de la soc. de chir., Dec. 5, 1877, p. 608.
Polaillon : La France méd., Nov. 4, 1877, p. 701.
Editorial in Brit. Med. Journ., Oct. 13, 1877, p. 530; on Communication by Parrot to Association for Advancement of Science at Havre.

the formation of osteophytes in the anterior fontanelle of the growing child, by means of which the sutures sometimes become ossified and the development of the cranium and of the brain interfered with, or even arrested.

These syphilitic changes in the ends of the long bones may require the microscope for their detection. Often, however, the changes are manifest to the unaided eye. The thickening at the end of the bone may be felt and seen. The paralytic symptoms are most obvious, the child will not and cannot move an extremity. The perforation of the skin and gummatous discharge can be seen and touched.

On cutting into the bone, the morbid line between the epiphysis and diaphysis may be distinguished as a reddened or grayish yellow band, and the prolongations of calcified cartilage can be seen and felt.

It is possible to divide the minute changes into three degrees:

In the first degree a layer of osteophytic growth may envelop the bone, sometimes making it so thick as to double its diameter. The epiphyseal cartilage is also thickened. The cartilage-cells become hypertrophied. Increased proliferation takes place within them, and the cartilage becomes prematurely infiltrated with earthy salts.

In the second degree there is premature calcification of the intercellular substance, and arrest of true bony formation.

In the third degree there is softening, and inflammatory changes take place.

The exact histological nature of the morbid process does not seem to be invariably the same, although the changes always take place in a line between the proliferating and the hypertrophic zone of the cartilage, as shown by Haab. This author, however, believes that the degeneration is a molecular degeneration of the cartilage along a line parallel to the line of ossification, the cartilage-cells falling into the molecular change and becoming disintegrated, after previous active proliferation.

Wegner looks upon the process as an osteo-chondritis beginning in the cartilage. He believes that the vascular supply through the vessels becomes deficient, through a too rapid deposit of bone-salts on the one hand, while the proliferating cartilage-cells, on the other hand, make a stagnating zone between the proliferating cartilage and the medullary spaces of the diaphysis.

Waldeyer and Koebner believe the process to be the formation of a syphilitic granulation tissue, growing out from the medullary prolongations of the diaphysis into the cartilage, and there falling into softening which leads to a shedding of the epiphysis.

In summing up it may be said that the changes produced in the ends of the long bones by inherited syphilis take place through the ossifying zone of the cartilage and the sub-periosteal tissue. They consist in hyperostosis and calcification, which may lead to permanent thickening of the bone without softening, or may be active enough to terminate by softening and cellular disintegration, as is the case in other gummatous formations.

The pathognomonic value of these changes in the ends of the long bones is very great, since no one has yet claimed to have found them produced by a cause other than syphilis, and they may, therefore, be largely instructive as to the cause of death in obscure cases, where repeated miscarriages take place, and the existence of syphilis in the parents is not on any other account suspected.

The treatment of syphilitic children upon whom these lesions exist

is very effective. It should be a mixed treatment, mercury being used by inunction, and the iodide of potassium given internally in repeated doses well diluted, commencing with a very small dose (half a grain or less for an infant) and increasing it steadily but slowly, as it is tolerated, until a dose producing an obvious effect is reached. A dose somewhat smaller than this maximum dose may be continued for some months after the child has recovered from all local evidences of progressive disease.

SYPHILIS IN THE INFANT.

A child born alive with inherited syphilis [1] may have its lungs so stiffened with interstitial, syphilitic, cellular changes that it cannot breathe sufficiently to support life. Its liver may be solid with parenchymatous changes, and it may grow visibly yellow and expire in a few days or weeks, without any especial symptoms on the skin or mucous membranes.

Digestion may be interfered with by the induration of the pancreas, which Birch-Hirschfeld [2] found to be so common in his autopsies of children dead with inherited syphilis. Occasionally a child dies in convulsions without any surface signs of syphilis.

Ordinarily, however, when a syphilitic child is born alive, even if it happens to be plump and fresh-looking for the first few days, very characteristic changes soon begin to show themselves. The face grows thin and old-looking. If there have been any eruptive phenomena at birth (excoriated, papular, scaly patches), these increase in number and extent. If the skin was intact at birth, it begins to show livid patches, which run on to become papular or pustular; or excoriations of livid color, and cracks and fissures appear, with pimples, boils, abscesses, and other lesions. Condylomata and ulcers at the anus are very common. The skin comes off from the fingers and is shed from the palms and soles in large patches; sometimes the nails come off. Mucous patches, fissures, and ulcers appear about the mouth. Catarrh involves the nostrils and the child gets the snuffles, the nostril caking-up to the point of complete obstruction, so that the child finds it difficult or impossible to nurse.

Meantime, the voice grows husky, hoarse. The child cries in a frightened, explosive way, or moans its life out in croaking sobs. Dry, tearless, pitiful crying is sometimes the method the poor little sufferer takes to announce his distress; but he soon becomes marasmic, and death cures him of his pains.

If, by careful nursing and active treatment, he pulls through, the child may become marasmic later, or be stunted in his growth, perhaps weakly in constitution, possibly hydrocephalic. During his early life he may have disease in his bones, ulcers, gummata in different positions, ocular troubles; indeed, he is exposed to a long series of disorders, which, if not controlled by antisyphilitic treatment, make life a burden and lead to destruction of tissue, to deformity, to loss of function in various important organs.

On the other hand, a child may entirely recover, and, after a reasonably prolonged treatment, grow up to good health and become as vigor-

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[1] Acquired syphilis (for example, vaccinal syphilis) is very serious, and often rapidly fatal in the infant; but it is similar to acquired syphilis in the adult, in that the visceral lesions only come on after a longer or shorter period of secondary eruptions.

[2] Archiv f. Heilkund., Feb., 1875.

ous as any one else. Such children, nevertheless, may have syphilitic teeth (p. 244), and be stamped with the syphilitic countenance for life.

The date of appearance of syphilitic symptoms upon children with inherited disease, who are born apparently in perfect health (as often happens), is very variable. Statistics taken in lying-in hospitals make the most common period about the second three weeks of life. Occasionally children grow up to be several months old before symptoms show themselves, and these symptoms may be quite light and be overlooked. In such cases, when tertiary symptoms come on quite late in adolescence or early in adult life, as they sometimes do, they almost invariably receive the cod-liver oil, iron, etc., believed to be of value in scrofulous complaints, and much important time is lost and tissue often sacrificed by failure to adopt antisyphilitic measures in time. Fournier has a case where inherited syphilis appeared at the age of 25; Zaulbaco has one at 26; Bulkley one at 23, and another at 24; Dron one at 20. I have now under observation a woman of 22, with gummata of the nose, due to inherited disease. Atkinson, of Baltimore, has called attention to this subject in an excellent paper upon "Late Hereditary Syphilis," in the American Journal of Medical Sciences, January, 1879.

This possibility of the appearance of lesions due to hereditary syphilis late in life must be constantly kept in mind, or mistakes are quite certain to be made, to the grave detriment of the patient.

SYPHILITIC PEMPHIGUS.

Flattened bullæ, varying in size from that of a small split-pea to that of a penny, situated upon a red base with a red areola and containing a thin sero-pus, are sometimes found scattered over the surface of syphilitic children at their birth, or coming out in crops shortly after birth. This is the pemphigus of the new-born ; it is nearly always syphilitic in nature. It is said of the infantile pemphigus not syphilitic, that it always first attacks other parts of the body, appearing later upon the palms and soles, while true syphilitic pemphigus starts always in the last-mentioned localities, and may indeed remain confined to them. The bullæ burst and show excoriated, livid surfaces beneath, or dry up into greenish yellow crust.

Children so intensely syphilitic as to have this eruption, very rarely recover under any treatment. Mercury by inunction is most suitable.

THE SYPHILITIC COUNTENANCE.

Certain physical traits of countenance, marked more or less strongly in different cases, are commonly enough encountered, upon growing children with inherited syphilis, to be considered pathognomonic of the disease. They constitute what Mr. Hutchinson calls the syphilitic countenance, and are striking enough to attract attention and to put an observant physician upon the track of syphilis in many cases before he has asked the patient a single question. A child with inherited syphilis does not necessarily have the syphilitic countenance. Many children, unmistakably syphilitic by inheritance, bear no marks that distinguish them from healthy children. One child in a family may be marked, and all born *later* may escape.

In a child somewhat stunted in growth, perhaps looking pinched in all its physical contour, or squared and dwarfed in stature, generally with an abnormal intelligence running to precocity which delights its parents, or to a stolid stupidity suggestive of idiocy—such a patient, a growing boy or girl, without any positive ulcers, or nodes, or other lesions indicative of syphilis, will be found often to have a coarse skin, with the pores more marked than usual. His color will not be ruddy, but sallow, dead-looking, dry, or perhaps greasy. His face will look flattened out, rather devoid of expression, prematurely old, grave, perhaps anxious. His forehead is rounded and prominent, like that of a hydrocephalic child. The eyes are often small, the nose undeveloped, particularly at the bridge, which remains broad and sunken as it was in babyhood. The corners of the mouth are often puckered with cicatrices, representing old ulcers at the angles; other scars may mark the mucous membrane lining the cheeks, and the throat may exhibit the ravages of past ulceration. Such a child is apt to have constant chronic nasal and pharyngeal catarrh. With this physiognomy the syphilitic teeth are apt to be found, and marks of old iritis, choroiditis, or interstitial keratitis, and more or less deafness, is rather the rule than the exception.

Fig. 22.

Fig. 22 (from Maury's Photographic Journal) represents very fairly the syphilitic countenance, together with scars of ulcers, nodes, overgrown and irregular bones, and the general unlovely shape, of a girl who has suffered severely from inherited syphilis.

SYPHILITIC AND MERCURIAL TEETH.

Hutchinson, in his Illustrations of Clinical Surgery, London, 1876 [1] has described and figured, with copious illustrations, the effects of syphilis in modifying the shape of the central incisors of the upper jaw, as well as the changes in the teeth produced by the use of mercury during their forming stage. Mercurial teeth are very often found in the mouth along with syphilitic teeth, and the mercurial teeth were generally considered to be also syphilitic until Hutchinson clearly pointed out the distinction between them.

The true syphilitic "test teeth," as Hutchinson calls them, are the two central incisors in the upper jaw, the teeth of the permanent set. The milk teeth do not show this typical peculiarity of structure, and no

[1] Fasciculus III., Plate xi.

other teeth can be relied upon to indicate the presence of hereditary syphilis, excepting the two above mentioned. The first set of teeth may be chalky, and fall into rapid caries ; the second set may also be very defective, falling rapidly into caries, some of them stunted in growth, some of them placed crosswise or altogether out of place in the mouth ; but none of these peculiarities are essentially syphilitic. On the other hand, a child may be markedly syphilitic by inheritance, and yet its teeth be perfectly sound.

The "test teeth" are only found in connection with inherited syphilis. The two central incisors are smaller than natural, and usually converge somewhat (Fig. 23, from a cast of a personal case), or diverge a little. The cutting border is narrower than the base of the tooth, making them peg-shaped, and along the lower edge they are uniformly notched with a single broad notch, as shown in the plate.

FIG. 23.

These single broad notches are the features of the teeth which stamp them as syphilitic. The serrations at the cutting border of the incisor teeth, produced by a number of shallow notches, mean nothing so far as syphilis is concerned. They are seen not infrequently upon all the incisors, of the lower jaw particularly. Irregular notches, even in the centre of the upper central permanent incisors, are not pathognomonic; and peg-shaped teeth, or teeth uneven in any respect, or badly placed or seamed or discolored, have no value as indicating antecedent syphilis. The "test teeth," as above described, are caused by syphilis, and are not caused by anything else so far as has yet been discovered. The cause of the peculiar deformity of the teeth is not accurately known.[1] It is believed to be due to stomatitis occurring while the teeth are forming, the notch being generally due to a chipping away of the edge of the teeth, which edge at first is very thin.

This mechanism of the formation of the notch, however, is not uniform, I believe, on account of a case which I watched from an early age. The notch was blunt and uniformly smoothed off, covered by enamel. The teeth were polished white and perfect, but typical in their general physiognomy. Both the parents of the child had syphilis, and she herself had lost her soft palate at an early age, had a number of eruptions, and, finally, syphilitic mania and gummata, while under observation. This child came under my observation at the age of fourteen years. She is now twenty-two, married, and the mother of a healthy child. Most of her teeth, including the test teeth, are smooth, clean, and reasonably white, and the notches of the test teeth are now as broad and smooth, and typical as they were when first observed.

Generally, when the edge of the notched tooth is thin, it chips off,

[1] At a recent meeting of the London Path. Soc., Mr. Hutchinson showed (Lancet, Dec. 6, 1879, p. 837) the crown of a milk tooth from a child with inherited syphilis. Two small abscesses formed in the middle line of the gum in this case, over the central incisors, from which, when opened, the crowns of the two incisors escaped. Mr. Hutchinson thought that this case helped to show why the central incisors are especially affected by inherited syphilis, and sustained his view that the sacs of the teeth *are inflamed* more or less in these cases—this accounting for the defect. He had *seen* a case similar to the one under discussion, once before, in a syphilitic child.

and wears down with advancing life, and finally loses its characteristic appearance.

Mercurial teeth (Figs. 24 and 25), according to Hutchinson, illustrate the effect of the excessive use of mercury—of mercurial stomatitis upon the permanent teeth. The teeth most plainly marked by mercurial stomatitis are the first (the anterior) molars. The incisors, all of them, and the canine teeth suffer. The bicuspids escape. The mercurial tooth is deficient in enamel, covered with ridges and spines of exposed dentine, dirty-looking, and apt to become promptly carious. Quite often only the half of the tooth farthest removed from the gum is unhealthy, the half nearest the gum preserving its enamel in a smooth and reasonably white

Fig. 24.

Fig. 25.

condition. The grinding surface of the molars is involved in the affection. Very naturally the influence of mercury is also often shown upon the typical syphilitic teeth, but this is accidental, and by no means essential.

Hutchinson states that other forms of stomatitis may also produce this change upon the permanent teeth, but it is more marked and more common after mercurial stomatitis.

INTERSTITIAL KERATITIS.

The cornea is frequently the seat of a chronic interstitial inflammation in cases of inherited syphilis. The affection is most common between the ages of six months and three years, most common of all during second dentition, but may be observed during adolescence. Occasionally it is encountered in acquired syphilis.

The affection comes on insidiously, with slight peripheral cloudiness of the cornea advancing toward its centre, attended by moderate photophobia and more or less of a peri-corneal zone of subconjunctival hyperæmia. Sometimes the symptoms become quite intense. The cornea gradually grows quite white, and sight may become so reduced that only the difference between light and darkness can be perceived. The cornea may become soft and fluctuating in spots by diffuse infiltration of pus. Ulceration is uncommon, or very superficial if it occurs.

Gradually, as the malady gets well, the whiteness disappears from the periphery toward the centre, leaving sometimes clouded spots behind. The iris, the choroid, and the ciliary body may be involved in inflammation during the course of the disease.

Both eyes may be involved consecutively. The affection in each eye lasts from a few months to more than a year. Relapse is possible.

Treatment.—Hygiene and dietetics form an essential part of the treatment in these cases. Cod-liver oil, tonics, and change of air are of great service. Treatment by mercurial inunction is of the most value, or mild internal mercurial preparation may be used, due attention being paid to the digestion. The course must be persevered in persistently, with confidence of ultimate success in preserving vision, if the general health remains good.

Local treatment is of some assistance, but not so valuable as the general measures. Warm fomentations in the beginning of the affection are strongly recommended by Noyes, and instillations of a solution of atropine are of considerable advantage, especially in those cases in which the iris is threatened or involved in inflammation.

TREATMENT OF INHERITED SYPHILIS.

In the chapter upon the general treatment of syphilis, great stress was laid upon the fact that mercury was a natural antidote to syphilis, more or less useful in all its stages, most valuable in its power of keeping the disease in check, and very certainly possessed of ability to gradually eliminate the disease, and retard relapses of symptoms. In tertiary forms of syphilis, however, mercury was accorded only a second rank among remedies, the preparations of iodine, notably the different iodides, taking the lead.

In inherited syphilis all the stages of the disease come together, as it were. The child is born already permeated through and through with syphilis, and possessing at the same time visceral and bony changes due to tertiary alterations of tissue and secondary phenomena, in the shape of excoriations, papules, pustules. The discharges from many of these lesions are essentially and actively contagious.

In inherited disease, notwithstanding these pathological facts, the iodides can usually be dispensed with, except when dealing with the late lesions of adolescence and bone lesions occurring during childhood. Commonly, all the good that can be obtained from treatment may be derived from a persistent use of mercury, not pushed to the extent of producing salivation.

Salivation is very difficult to produce in young infants. Excess of mercury given to them generally runs itself off by the bowels. Just before, and during the period of second dentition, especial care is necessary in the use of mercury, in order to avoid causing enough stomatitis to give rise to mercurial teeth.

Mercury is introduced into the circulation of syphilitic children preferably through the skin. The only obstacle to this is extensive ulceration of the surface (and even this does not preclude the possibility of dusting the skin with calomel), or the existence of so great an irritability of the integument, that the local use of mercury cannot be borne. This, however, is exceptionally uncommon. The advantage of administering mercury by the skin is that it spares the child's stomach for food. At no period of life is it so essential that the stomach should be unhindered in the performance of its function as during babyhood. Another excellent reason for employing inunction upon babies is, that it is often impossible to say whether they get enough mercury if the stomach is relied upon, and valuable time may be lost in this uncertainty. Some babies vomit more or less after each feeding, and are constantly regurgitating between

their repasts, and whether all of a powder or potion given internally stays down or not, is sometimes a matter of great uncertainty.

If inunction is decided upon, from five to twenty grains of the ten or twenty per cent. oleate of mercury may be rubbed daily into a different part of the child's integument, the dose being regulated by the intensity of the symptoms and the age and vigor of the child. A better plan than this, and one the infants seem to prefer, although it is dirtier, is to spread upon the flannel belly-band of the child a thick patch of blue mercurial ointment, and bind it against the integument, removing it daily, and washing the skin well with warm water and soap.

If any eruption or mercurial erythema appears at the site of the mercurial application, a new spot should be selected, and the irritated skin washed with a delicate toilet soap and abundantly powdered, while a piece of old linen should be worn under the binder, between it and the impending mercurial eruption. While the belly is recovering, the legs, thighs, feet, and arms may be used for inunction or for the continued application of ointment upon bandages.

By this too much mercury can hardly be used. As soon as the snuffles, the eruptive lesions, and the restlessness of the child begin to mend perceptibly, the quantity of inunction or of the ointment bound upon the surface may be diminished; but the treatment must be kept up steadily in a mild way in some form or other, certainly as long as through the period of the second dentition.

If for any other reason it is deemed advisable to use mercury internally instead of by inunction, the gray powder, mercury with chalk, is a preparation sanctioned by long usage. This may be administered in powder, commencing with a sixth to a quarter of a grain two or three times a day, and working up the dose rapidly or slowly according to the intensity of the symptoms, until the latter show signs of yielding or the bowels are irritated by the drug.

In the latter case it is better to diminish the dose or to substitute inunction, or, in some cases, where a continuance of a large dose is very desirable, the bowels may be quieted by the internal use of mild doses of opium. This, however, will very rarely be called for.

A good way of producing a rapid effect of mercury upon a child is to dissolve a half grain of corrosive sublimate in six ounces of water, and to give a teaspoonful of this hourly for the first day, then every two hours, finally every three hours or at longer intervals, unless it obviously disagrees.

Indeed, I know of no internal preparation which agrees better with an infant than a solution in water of the corrosive chloride of mercury. I have used it in various other disorders as well as in syphilis, and I think the best way to give it is to order a half-grain of corrosive sublimate to be dissolved in six ounces of water. Each teaspoonful of this mixture contains one ninety-sixth of a grain of the drug, and is a fair dose, if it is frequently repeated.

This watery solution has absolutely no taste. The child who will spit out a powder will take this solution, believing it to be water. The medicine will mix with milk without turning it, or with any food in such a way that its presence is unsuspected; and if the whole or a portion of a given dose should be regurgitated by an infant, it is not a very serious matter, since the doses follow each other in such quick succession.

I have not yet found this preparation to disagree with the youngest infant. The average interval between the doses has been three to four

hours for prolonged treatment, the intervals being shortened when a prompt or vigorous mercurial influence was desired. Mercurial stomatitis I have not seen accompany the use of this remedy in this way, and intestinal disturbance is equally uncommon—plenty of warning being given by premonitory symptoms before any explosion comes on, so that there is time to avert the latter.

Dr. M. A. Wilson experimented with this treatment, at my request, upon a number of infants with inherited disease, at the Out-Door Department of the New York Foundling Asylum; while Dr. E. R. Chadbourne, house physician in the same institution, kindly conducted another series of experiments for me in the same direction, upon infants, during the summer of 1879.

Both of these gentlemen have reported favorable results, so far as tolerance of small doses of the bichloride by young infants is concerned, the absence of any irritating or evil effect of any kind, and the prompt influence of the course upon the cutaneous lesions of inherited disease.

Many cases died, as they do under all treatment; but even in most of these the visible symptoms seemed to be favorably modified by the drug.

The cases treated by Drs. Wilson and Chadbourne ranged from birth to two years of age, the doses of mercury from the $\frac{1}{120}$ to the $\frac{1}{96}$ of a grain. The intervals between the doses were never shorter than two or longer than four hours—average three. In only one case out of a dozen experimented on did any gastric or intestinal disturbance come on, and this was promptly allayed by lengthening the interval between the doses.

Iodide of potassium may be administered through the milk of the mother, or in mild doses by the mouth of the infant, provided the dose be given with the food and be itself considerably diluted with water.

In no case should a child born of syphilitic parents, whether it shows evidences of inherited disease or not, be allowed to suckle a healthy wet-nurse. The risk of infecting the latter is too great to be overlooked. A syphilitic child may, however, suckle its mother with advantage, and can never infect her (Colles's law), even although she be considered healthy and has never shown any symptom of syphilis. The same rule applies to a wet-nurse. A syphilitic woman may have recovered and may secrete good milk, and such milk is perfectly suitable for the child, while the latter cannot poison the nurse.

PART III.

GONORRHŒA AND ITS COMPLICATIONS.

CHAPTER I.

GONORRHŒA IN THE MALE.

Definition.—True Gonorrhœa is not acquired by Contact of the Urethra with Pus not in itself Gonorrhœal.—Cases illustrating that Urethral Pus does not always produce Gonorrhœa in the Female, nor Vaginal Pus in the Female always Gonorrhœa in the Male.—The Causes of Urethral Inflammation.—Symptoms of Urethritis in an Unhealthy Urethra not due to the Contact of a Virulent Pus.—Symptoms of Inflammation in a healthy Urethra, due to Contact of Gonorrhœal Pus or other Irritating Substance, under Circumstances capable of generating Urethritis.—Chordee.—Lymphangitis of the Prepuce.—Spasmodic Stricture.—Breaking the Chordee.—Gleet.

Gonorrhœa in the male is an intense urethral inflammation, characterized by a period of incubation, and by a profuse discharge of pus which possesses virulent qualities.

This definition at once places gonorrhœa in the rank of virulent diseases, a position not accorded to it by some writers in high authority. Yet it is impossible to see why gonorrhœa should not be called virulent. It has a period of incubation, runs a course of varied length, possesses its virulence to the very end, and is in the highest degree contagious. These are the qualities to which syphilis and chancroid owe their claim to virulence, and why should the title be denied to gonorrhœa?

The reason for taking gonorrhœa from the list of virulent, and placing it among simple diseases, is that intense urethritis resembles it so closely in all its symptoms that, clinically, a diagnosis between them often cannot by any possibility be made. This, however, is simply due to the fact that the symptoms of inflammation of the urethra, when they run high (as they always do in gonorrhœa), are alike, whether their cause is a simple or a virulent one. Theoretically, a distinction must be recognized between urethritis and gonorrhœa, although practically such a difference oftentimes cannot be demonstrated, and clinically the symptoms of inflammation of the urethra have to be treated symptomatically in accordance with the grade of their intensity, without regard to the cause, since medicine as yet knows of no specific for gonorrhœa.

There are many reasons for maintaining this ground. The intensely contagious quality of gonorrhœal pus has been too long and too well

known to require more than a mention. It has been amply demonstrated by direct experiment (largely by French investigators) from urethra to urethra. Rollet refers to it at some length. It has been demonstrated with equal certainty by oculists, by inoculation of the conjunctiva for clinical purposes. In course of nature it is often disastrously demonstrated upon the victim who has exposed himself to it in sexual intercourse; and the eyes of a patient with gonorrhœa may also attest the powerful contagiousness of the disease.

No one can possibly dispute the fact that, if pus taken from a case of true gonorrhœa be placed upon the orifice of the urethra of the male, or the vagina of the female, an inflammatory disturbance of considerable intensity will be lighted up.

On the other hand, it cannot be denied that pus of the most varied character (not gonorrhœal) may be placed upon the meatus of the male urethra, or poured along its course, without inflaming the canal. In cases of intense balanitis beneath a very tight prepuce, the cavity of the foreskin is constantly filled with dense creamy pus; yet in such a case, if the foreskin be slit up, it is customary to find the glans penis excoriated in patches, and the meatus of the urethra raw perhaps, but no urethritis. Chancroid sometimes is situated within the very lips of the meatus, and extends a certain way down the canal, but it does not give rise to gonorrhœa. Pus from pyelitis may be voided as thick as cream through the urethra, but it does not occasion inflammation of the canal.

In the female, pus from the kidney or bladder, passing through the urethra, pus in vast quantities coming from the uterus, pus from chancres, and chancroids, and mucous patches—none of these kinds of pus produce gonorrhœa in the female.

Finally, the male may often, usually in fact does, cohabit with a female whose vagina contains more or less pus from the uterus, and remain well; while in many cases a man with a more or less purulent discharge may lie with a woman, and she will remain sound. Not so in either case, however, if there be even a very little of the poison of gonorrhœa in the case. A gleet after a gonorrhœa which is nearly well may give a gonorrhœa to a woman, and a small amount of lurking gonorrhœa in the vagina may easily poison the male.

Just at this point comes in all the difficulty of the problem. We hear very little of it from the female side. A large percentage of men in cities have a small amount of gleet from one cause or another, mostly in connection with stricture; yet gonorrhœa in the females (their wives), with whom they cohabit, is far from being common—it is, indeed, very exceptional. In France, a gleet is considered a natural thing with a soldier, so much so that it is called the "military drop;" but the women with whom they live are not phenomenal in having any analogous disorder. Indeed, there are certain forms of urethral discharge which seem to call for the married state for their cure, which get well during regular sexual hygiene, and do so without involving the wife in any disorder. I have repeatedly sanctioned marriage while a patient had still a slight amount of urethritis, which would not get well because he was engaged to be married and was therefore, perhaps, constantly suffering from ungratified sexual desire, due to stimulation without relief: and I have seen the happiest result follow such a marriage. I know that this course is a very unsafe one. I do not recommend it as a rule for general use. I distinctly condemn it. It is assuming an enormous responsibility to tell a man with a urethral discharge to marry an innocent, virtuous woman; yet it must be done some-

times after deliberation, and, if there be no gonorrhœa in the male, the woman is perfectly safe. If there is a considerable amount of pus, a great creaminess in the urethral discharge, it is wise to postpone marriage until this has been reduced; but an urethral discharge, not very freely purulent and not dependent upon true gonorrhœa, does not disqualify a man from marriage, any more than a leucorrhœa disqualifies a woman.

This point is such a delicate one that I am constrained to dwell upon it, and to illustrate it by the recital of several cases.

A gentleman came to me with the following story. He had been married several years and remained true to his wife. He went abroad. Shortly before returning, while in England, he fell from grace on one occasion, several days before going aboard ship. He felt uneasy during the return trip, and when nearly home noticed a slight mucous moisture in the orifice of the urethra, upon rising in the morning. After returning home he feared to have intercourse with his wife, and his discharge became worse. He consulted me. I found that his discharge was mainly mucus, although quite palpable and only purulent in the morning. He had had a former gonorrhœa in youth. I concluded that gonorrhœa was impossible, since more than two weeks had passed since the time of his exposure, and his discharge did not indicate virulence. I therefore told him that he was keeping up a mild urethritis by sexual stimulation without relief, and advised immediate renewal of relations with his wife. This prescription was faithfully carried out, with the effect of prompt relief to the urethral discharge, without other treatment.

This same gentleman came to see me after another European trip; but this time he had not exposed himself. He arrived home while his wife was menstruating, and soon found that he had a slight urethral discharge something like what had troubled him so much before. For this he consulted me. I ordered the same prescription, and cure followed at once.

Another patient, living quietly and regularly, performing his marital duties without exposure, after hard work in a cold winter, found that he had an urethral discharge which was quite positively purulent. During the treatment of this he ran down in health, became rheumatic, and had a perineal abscess. After the abscess was nearly well, while the urethral discharge was still clearly purulent, although getting decidedly thinner, he resumed his sexual relations with good effect and without damaging his partner. This man had an unhealthy urethra damaged by a former gonorrhœa, but ordinarily he was perfectly well.

I have repeatedly been consulted by men with an urethritis which yielded some pus, who were married and in constant sexual relations, which they stated had a good effect upon the discharge, the wife remaining well.

A very striking case is the following: a patient of mine had persistent purulent gleet of several years' duration, due to stricture and following gonorrhœa. Under hygienic and tonic influences, assisted by cutting the meatus and using a very large steel sound, he got entirely well. He continued well a couple of years, and then became engaged to marry.

While waiting for his wife to get ready he became overstimulated sexually, and visited an old partner on one or more occasions. As a result, apparently, his purulent gleet returned.

For this I treated him in every way known to me without success. I could reduce the discharge to a rather profuse mucous gleet, without much creaminess in its quality, but no further. I cut him internally, according to the modern doctrine, as an experiment, to which he consented, until his

urethra was very unnecessarily large, the so-called full size being reached. The effect of this cutting was not to cure the gleet, but to give the patient, at the site of the incision, a hard, fibrous lump in the roof of the urethra, which caused his penis to bend painfully upward during erection for many months. Meantime the discharge continued unabated, and the patient put off his marriage from month to month.

I finally became convinced that there was no poisonous (gonorrhœal) quality in the discharge, if there ever had been any, and I urged the patient to marry, since the hard lump in the roof of his urethra had now subsided, so as to allow an erection to occur without pain. But marry the patient would not, being afraid of poisoning his wife.

I therefore took him to see in consultation a well-known specialist in urethral disease in this city. The latter, as I had anticipated, advised that the urethra be again cut internally. This I declined to do, and asked my patient to put himself under the charge of the physician whom I had requested him to see with me. The patient, however, would not do this unless I would guarantee a cure; and this I could not conscientiously do. His discharge of pus, therefore, continued thin and watery, but quite abundant; and his future wife commenced to talk of discarding him.

I now absolutely forced this man to marry. I took all the responsibility. Offered to do everything for himself and for his wife in case of accident, and to protect him from her censure. Thus I finally succeeded in bullying him to the altar, convinced as I was that treatment was useless, and that the man's urethritis was kept up by ungratified sexual desire.

He married on a certain day, informing me the day before that he would not leave town after his marriage, since he expected both that he would immediately suffer from an increase in his discharge and that his wife would become poisoned.

It was three weeks when I next saw him. He looked fat and healthy, but disturbed. I asked him how he had been, and how his wife was. She was in good health, and his urethral discharge had ceased shortly after his marriage. But, he said, it is all coming back again. I am beginning to have a discharge, and to feel the old sensations in the urethra yesterday and to-day. I asked him when his wife had begun to menstruate. He replied, "The day before yesterday."

What can be more strikingly illustrative of the effect of sexual hygiene upon an urethral discharge than this case? I told the man to do nothing, and that he would again recover shortly after his wife had ceased menstruating, and that when he became sexually calmer he would not suffer during the monthly sickness of his partner. He went away contented, and has never been a patient of mine since. I met him upon the street about two years afterward. He looked well, and, in response to my question, said that he was perfectly well, and that his wife had presented him with a fine boy.

It is possible to multiply instances of this sort without limit, but enough has been said to show that an urethral discharge in the male does not necessarily produce gonorrhœa in the female. If the discharge in the male be the tail end of a gonorrhœa, however, then the woman is fortunate, indeed, if she escapes contagion.

Finally, as to the power of pus in the vagina to give gonorrhœa to the male. Doubtless the male often, and most often, indeed, gets his urethritis from contact with such irritating discharges, but he does not necessarily become irritated by them at all. Indeed, he usually escapes, unless his own urethra has been damaged by previous gonorrhœa, and he

happens to be himself either debilitated, overtired, or full of liquor, or suffering coincidently from very acid urine, or unless he overstimulates himself sexually. All of these causes are capable alone of producing urethritis; each of them separately may do it, as recorded cases attest; even intense sexual excitement, much prolonged, without any sexual contact at all, and, a fortiori, if the local influence of irritating discharges lends a helping hand.

When a patient, however, offers himself, in sexual exposure, to the poison of true gonorrhœa, he is certain to become poisoned without the coöperation of any of the adjuvants mentioned above. A simple exposure is enough. The result is quite certain, and very evident.

The theoretical distinction, therefore, between gonorrhœa and urethritis is clear; the clinical distinction is often equally so. Yet, without doubt, an intense urethritis is one and the same in its symptoms, whether its cause be gonorrhœal virus or any other irritating internal or external cause; and the treatment of intense urethritis is the same, whether its cause be virulent or otherwise.

Cause.—From what has already been written, it may be inferred that the causes of urethral inflammation are quite varied. The cause of true virulent gonorrhœa is single, namely, contact of the affected person with gonorrhœal pus from another person. Urethritis, however, may be produced in a variety of ways almost infinite, and it cannot be distinguished in its symptoms, when intense, from a gonorrhœa. This fact cannot be too often repeated. That surgeon is bold indeed, who, in face of a certain urethral discharge of given intensity, will pronounce upon its origin with any confidence. No one can be accused of impure relations because he has a profuse urethral discharge. It cannot even be said that such a person has had sexual intercourse at all; for it is possible for a man, virgin of all venery, to have an intense urethral inflammation, and much injustice may be done by accusing him, on the one hand, or, on the other, of accusing his partner—if he has had one—of having given him a disease.

The moral is, that the physician is not a judge. His function, if he has any of the judicial sort, is to shield the innocent. He should accuse no one, but confine himself to his own proper duties, and treat the symptoms of the patient.

If the urethra is healthy, it does not easily become inflamed, excepting by contact with gonorrhœal pus. Yet, a healthy urethra does sometimes suppurate after mechanical violence, such as the rough introduction of instruments through it; after chemical violence—the injection of irritating substances for experiment, or under the idea of employing a prophylactic against supposed infection. A healthy urethra may also become inflamed by the combined influence of venereal excitement—especially if intense or prolonged—and contact of an irritating discharge, leucorrhœal pus, menstrual blood, etc.

An unhealthy urethra is always ripe and ready for inflammation. In strumous, strongly lymphatic, gouty, and rheumatic subjects, the urethra seems prone to take on inflammation easily, especially if the person be cachectic, overworked, or at all reduced in general health from any cause. In such cases the mucous membranes generally are apt to be in an irritable condition, and to take on subacute inflammation from trivial causes.

When the urethra is actually diseased, on account of the previous existence in it of acute inflammation—when it contains a thickened, hyper-

æmic patch, constituting a slight stricture—then it is in a prime condition to be irritated into suppuration—often a suppuration of formidable proportions — by causes which, in a healthy urethra, would fail of producing any obvious result. This is especially true when the urethra, besides being the seat of a chronic patch of congestion left behind by an old gonorrhœa, is, at the same time, diathetically unhealthy, owing to the broken health, the bad hygienic surroundings, the cachectic condition, the nervous prostration, or the scrofulous or gouty constitution of the patient.

When the urethra is unhealthy, the introduction of a sound will sometimes produce quite a sharp attack of urethritis. The passage of very acid urine through the canal may bring about the same result, whether the uric acid crystals be due to indigestion, an attack of gout, or over-stimulation by alcohol (particularly beer or champagne). Mere excess of sexual excitement will sometimes produce a flow of pus, and prolonged sexual intercourse may do the same, particularly—and this is one of the most active causes—if there be any irritating discharge in the vagina. In early married life the male is not unlikely to get a little urethritis from his wife; but after his approaches become less amorous, he has no further trouble.

In connection with many morbid states of the prostate (cancerous, tubercular, inflammatory), and of the urethra (herpetic, chancrous—in deep urethra, tubercular, syphilitic) a more or less purulent flow from the urethra may be encountered, and a purulent discharge dependent upon organic stricture is of every-day occurrence.

Symptoms.—In studying the symptoms of inflammation of the urethra, it will be convenient and practical to make two classes of cases, and briefly to review the symptoms in each.

Symptoms of urethritis of an unhealthy urethra, not due to the contact of a virulent pus.—This is by far the commonest form of urethritis. This is the form which those people have who say they have had a dozen cases of gonorrhœa, and of those boasters, who claim that they get the gonorrhœa constantly, but that they do not mind it, as they have a little injection which cures it up in three or four days. In this form the patient gives himself the disease much more than his partner gives it to him. He has a damaged patch of mucous membrane within his urethra, and any one of a number of exciting causes is sufficient to kindle the slumbering congestion into an active discharging inflammation.

In these cases the discharge originates at a certain distance within the urethra from the very start. It does not commence at the meatus. The patient has intercourse perhaps with a woman who has no gonorrhœa —who at most has a purulent leucorrhœa. In twenty-four to forty-eight hours he presents himself to the physician for inspection, stating that he has an attack of gonorrhœa.

Inspection now shows that the lips of the meatus urinarius are not in the least swollen. The attack manifestly has not begun at the meatus. The lips of the urethral orifice still show the livid line so often seen when there is stricture in the course of the canal. The discharge is thick and purulent from its very start. There is little or no itching, or tingling, along the course of the urethra. There is some heat and smarting in the urethra during the urinary act, but very little discomfort between times.

A discharge starting in this way is not a gonorrhœa; but it may go on and assume all the quality of the most intense urethral inflammation, accompanied by any of the complications of gonorrhœa, and absolutely in-

distinguishable from it clinically; or it may subside in a few days, or, at most, weeks, under moderate symptomatic treatment, and give very little discomfort. The latter termination is by far the more common.

Symptoms of inflammation in a healthy urethra due to contact of gonorrhœal pus, or other irritating substance, under circumstances capable of generating urethritis.—Urethritis, under these circumstances, always commences at the meatus. If the cause has been inoculation with gonorrhœal pus, there is always a period of incubation between the moment of exposure and the outbreak of the first symptom. This incubation period is usually from five to eight days. When, however, the cause is some irritating discharge, not gonorrhœal, commonly the evidences of commencing irritation at the meatus appear on the second day; sometimes they are delayed up to the fourth, or even sixth, but rarely any longer.

The first symptom in these cases is an œdema of the meatus, which makes the lips of the urethral orifice pout. This swelling may be insignificant in urethritis; it is invariable in gonorrhœa. The color of the orifice of the urethra is pink rather than blue. The patient feels a sensation as though a hair had been caught in the meatus and was being drawn through it. There is a sensation, varying between a tickling and an itching, which is quite apt to be complained of, either at the very meatus or at a point about three-quarters of an inch within the urethra, upon its under side. These sensations keep the patient's mind fixed upon his genitals, and call upon him to empty his bladder rather more frequently than usual. The passage of urine over the tender ends of the urethra causes a hot, stinging pain, an ardor urinæ, more or less intense, in different patients.

Between the lips of the pouting meatus, perhaps faintly sealed with dried mucus, a drop of watery pus is seen at all times during the first twenty-four hours. On the second day this drop becomes more creamy, and all the disagreeable sensations increase, while from day to day the discharge becomes more copious and more purulent.

During the second week the pus from the urethra assumes a green tint, due to slight admixture with blood, and all the symptoms intensify, unless the discharge turns out to be a mild urethritis, in which case it sometimes reaches its height during the first week, and commences to decline during the second. This it never does if it is true gonorrhœa.

Chordee.—If the inflammation runs high at the end of the second and during the third week, erections become painful. The inflammation does not remain confined to the surface of the urethral membrane, but works down through the minute ducts into the mucous glands of the urethra, and spreads from thence to the delicate meshes of the spongy tissue of which the corpus spongiosum is composed. These meshes of tissue, becoming stiffened and agglutinated together by the inflammatory process over a given (usually limited) area, no longer allow themselves to become distended by the influx of blood which occurs during erection. As a consequence, when the rest of the penis is distended with blood, and only a limited portion remains empty, the empty part, being relatively too short, draws together the distended parts, acting like a cord to a bow, and the penis becomes curved, its point of greatest concavity corresponding to the inflamed area of corpus spongiosum. The inflammation often does not run so high as to obliterate the meshes of the corpus spongiosum, but renders them sensitive when dragged upon. In such a case there will be a painful, perhaps hard spot in the urethra upon erection, but no bending of the penis.

This bending of the penis is called chordee. Painful erections are very common during the third week of a gonorrhœa, and from that date onward until the discharge has ceased. Sometimes erections still continue to be somewhat painful after the flow of pus has entirely disappeared.

During the second or third week, in some cases, the prepuce becomes implicated in inflammation. This is due to a lymphangitis, generally of the smaller lymphatic vessels. As a result the foreskin may swell enormously, and become white with œdema, and this œdema may go on to involve the whole penis. It frequently leads to paraphymosis, when the prepuce is short. If the very finest lymphatics are the seat of the inflammation, the prepuce swells, but is red, hot, erysipelatous, there is comparatively little œdema, the tissues of the prepuce are inflamed and stiffened with inflammatory exudation. If the prepuce be long, phymosis is apt to occur, and occasionally the inflammation runs on to the extent of producing abscess between the layers of the prepuce.

When the prepuce is tight, although it may not become inflamed in its own texture, yet if the gonorrhœal discharge is not kept carefully washed out of its cavity, the pus is apt to be retained in the furrow behind the glans penis, and there becoming decomposed, to give rise to balanitis and posthitis, and to lead to the formation of innumerable warts, the so-called venereal warts, which are always apt to be produced by uncleanness beneath the prepuce.

As the inflammation extends backward within the canal of the urethra, the deep urethral muscles are apt to be thrown into spasm, which leads to dribbling of urine and difficulty in voiding the contents of the bladder. Sometimes actual retention comes on, usually only in connection with active inflammatory congestion of the prostate and cystitis of the neck of the bladder. Abscess of the prostate, peri-urethral abscess, perineal suppuration, inguinal glandular abscess, are among the possible complications of intense inflammation of the urethra, while swelled testicle is a sequence so common as to be often considered a complication rather to be expected than not in severe cases. Inflammatory complications of the fundus of the bladder, and of the kidneys, are possible, but rare in connection with gonorrhœa.

When the urethral inflammation runs high, hæmorrhage from the urethra may occur, either spontaneously during erection or as a result of straightening the curved penis during erection. When the penis is so straightened the inflamed spot of corpus spongiosum may be ruptured through the mucous membrane of the urethra, and violent hæmorrhage may follow, to say nothing of the traumatic stricture which is sure to appear subsequently at the point of rupture.

In those rare cases where upward chordee appears on account of inflammation of the corpus cavernosum, violent straightening may cause effusion of blood within the sheaths of the corpora cavernosa, but rarely produces free bleeding from the urethral surface.

After the urethral flow has continued at its height for a period varying from one to a number of weeks, all the inflammatory symptoms gradually subside, chordee becomes less frequent and less intense at night, the discharge lessens, and finally ceases entirely. It may relapse, leading to a new discharge lasting for several weeks, or prolong itself indefinitely in the shape of a gleet, which is more or less puriform in different cases, and subject to exacerbation and improvement, from time to time, from varied trivial causes.

GLEET.

Gleet is chronic urethritis. A severe and protracted gonorrhœa may run on into a gleet after passing through the acute stage, and remain as a gleet indefinitely. The discharge from the urethral orifice in gleet is a blue, thick, mucoid material, more or less purulent and creamy in different cases. Generally, in gleet, the lips of the meatus are found sticking together when the patient wakes in the morning, a small amount of the discharge having scabbed over the meatus. Behind the scab there may be a drop of pus, or there may be none.

Some cases of urethritis are so mild that they are gleety from the start, and never become freely purulent.

Gleet may exist as a symptom of stricture of the urethra, and of the most varied, prostatic, inflammatory, and degenerative troubles, not in the least degree venereal in origin. The only real interest which attaches to gleet in a venereal way is the question of the contagiousness of gleet.

The gleet following a gonorrhœa is poisonous. How long it retains its virulent quality is not known. Gleet from stricture and prostatic lesions does not possess contagious qualities. It is often impossible to pronounce positively upon a gleet, and to say whether it is contagious or not; but there is a very safe rule to go by, namely: when a gleet is frankly and freely purulent it is apt to possess contagious properties; gleet which is mucoid, blue in color, sticky in consistence, is incapable of lighting up inflammatory trouble in another.

CHAPTER II.

TREATMENT OF URETHRAL INFLAMMATION IN THE MALE.

The Relation of the Physician to his Patient during the Treatment of Urethritis.—The Abortive Treatment of Gonorrhœa.—Hygienic Treatment; Medical Treatment by Alkaline Diuretics, by Sandal-Wood Oil, by Copaiba (Copaibal Erythema), by Cubebs, by Turpentine, by Iron, by Tincture of Cantharides.—The Internal Treatment of Gleet.—The Use of Injections in Urethritis.—How to Inject the Urethra.—Dressings for the Penis during Urethritis.—Treatment of Chordee.—Treatment of Painful Urination.—Treatment of Retention of Urine in Gonorrhœa.—Treatment of Venereal Warts.—Treatment of Inflammatory Phimosis.—Paraphimosis and its Treatment.

THE treatment of urethritis is accompanied by moral difficulties not experienced to the same extent in connection with any other malady. When a man gets urethritis he rarely feels willing to acknowledge that it is largely, perhaps wholly, his own fault; and it is not customary to see him stand up and take his punishment like a man. He generally accuses his partner of all the blame for his misfortune, although she, indeed, may have no contagious disease; he feels ashamed of himself, tries to sneak out of his troubles, and demands of his physician anything and everything, asserting that he positively must be cured in a few days. He will nearly always demand, with impatience, how long it will be before he will be well, and he calls for violent measures in order that the course of the disease may be cut short. If he is not satisfied on these points, and promised a speedy cure, he refers to some friend, or perhaps to a number of friends, who laugh at gonorrhœa, and tell him that they constantly get it and cure it for themselves in a few days with some favorite prescription; and it is by the standard of this misinformation from friends that the result of the physician's efforts is often judged.

In syphilis the patient is far more frightened than when he has gonorrhœa, but he never disturbs the physician by asking for a cure within a few days. The popular idea about syphilis is that it lasts forever, and the patient with this disease asks his physician not to cure him promptly, but whether he ever can get the poison thoroughly out of his "system," as he puts it.

If, therefore, the surgeon allows himself to be browbeaten by the ignorance of his patient, he has to commence the treatment of urethritis—a very obstinate disease—under most disadvantageous auspices; and the patient is apt in the end to be dissatisfied with the result, no matter how creditable that result may really be. To be just to himself, the surgeon must start as master of the field, if he hopes for any comfort; and the only way to do this with a foolish young man suffering from his first attack, or with an anxious husband who expects his wife to return home in ten days, is to have a perfect understanding at the very commencement of treatment.

The patient should be informed that gonorrhœa, badly managed, is as

serious a matter, in many cases, as syphilis; that gonorrhœa probably kills more patients than syphilis does, through its ultimate effect, by means of stricture of the urethra, upon the bladder and the kidneys. If the patient's associates find gonorrhœa to be so light a matter, it is well to refer him back to them for treatment. The surgeon should absolutely refuse in any case to give a promise of cure in any given time. He cannot give such an assurance honestly, and if he happens to hit right with his guess in the case of one patient, that patient will injure his reputation greatly; for he will boast among his companions of a prompt cure within a certain promised number of days, and his friends will come with their gonorrhœas and demand a like promise and a like speedy cure, and failing to get it, will denounce the physician as incompetent. No man can positively assert at the start whether a given urethral inflammation just commencing at the pouting orifice of a healthy urethra is to be a severe case or not, or whether it will yield a prompt response to remedies.

If a man has already had several attacks of gonorrhœa, and his present attack comes on without any œdematous swelling of the meatus urinarius, the chances are that the attack will be a mild one. If the case is one of first attack, and there has been not more than forty-eight hours' incubation, the chances also are that the inflammation will not be violent. If there has been no sexual intercourse at all to occasion the new outbreak, then, although the course of the malady may be slow and its duration protracted, the symptoms are not apt to run high.

In any case, so far as making a prognosis is concerned, it is proper to say to the patient that he has a disorder which is perfectly curable by gentle treatment, but which often fails to get well if harsh measures are used; that the symptoms require intelligent management, according to their intensity; that it is safer and surer in the end to make haste slowly, and that all will be done by treatment that can be effected by drugs.

Under such an understanding, the surgeon's hands are free, and the patient's mind at rest, because he (the patient), under the circumstances, will either seek treatment elsewhere, or he will yield himself up to his physician, and follow his instructions with willing confidence. Then, if the case turns out to be a mild one, and gets well in a fortnight, the patient is delighted and appreciative. If it drags itself along for two or three months, he is regretful, but satisfied.

The abortive treatment of gonorrhœa should not be attempted. It is accompanied by considerable danger, and is absolutely uncertain. Those cases which get well under its use are cases of urethritis which doubtless would have recovered promptly under mild treatment. When it does not cure, it greatly increases the grade of intensity of the inflammation, and leads with much certainty to stricture ultimately, and immediately in many cases to complications on the side of the bladder and testicle, not devoid of danger to important functions. As a general rule, it will be found that those who have most faith in the value of the abortive treatment are those who have not tried it at all, or medical men and young practitioners who have not had much experience with the disease. After a few disastrous failures, the practice is generally abandoned. The few authorities in high position who advocate the abortive treatment are becoming yearly more oracular in their utterances, more reserved in promising any certain effect from the use of harsh injections very early in the course of a gonorrhœa. I do not assert that abortive treatment does not sometimes seem to cut short an attack of urethral inflammation, but I certainly maintain that no man can assert that it will always do so, no mat-

ter how it is used; and I believe that the damage it does in the cases in which it fails far outbalances the alleged good it accomplishes in cases of apparent success. I doubt greatly whether a true virulent gonorrhœa can be aborted by the use of strong or astringent injections at the start.

The treatment of urethritis which aims at an intelligent management of the symptoms according to their intensity, once adopted, is not likely to be given up for any other plan, because the results are in the main so satisfactory. This treatment is hygienic and medicinal.

Hygienic treatment of urethritis.—Absolute regularity of life should be enjoined in all cases from the start; anything like irregularity is detrimental. The patient should rest as much as possible, lying down rather than sitting or walking. He should indeed avoid exercise at first, and keep as far as possible in a uniform temperature. Regularity should be practised in sleeping and in eating, and particular attention should be bestowed upon the function of the intestine.

The amount of food taken at the beginning of an attack should be moderate, its quality bland and unstimulating, its nature light and varied. If the patient be debilitated, on the other hand, plenty of meat should be allowed, the full ordinary amount of food should be taken, and in some cases even a little red wine from the very beginning. Milk is an excellent article of diet in all cases. Where it cannot be promptly digested, the work of the stomach may be made easier by adding salt to the milk; and a laxative, such as a dinner-pill, may be given at night, or a little compound liquorice powder, or, if the patient prefers, some bitter sulphate of soda-water in the morning.

Among the articles of food to be avoided in all acute cases (excepting those coming on in decidedly debilitated subjects, when intelligent exceptions must be made), are pastry, gravies, fried fats, and greasy articles of food, all rich made-dishes and indigestible substances, all condiments of every description, excepting in the mildest form. Salt, however, is not objectionable; pickles and acids usually are. Asparagus is harmful to some patients.

Among the drinks to be avoided are strong coffee and tea; chocolate in any form, since this beverage stimulates the sexual appetite; all wines and liquors of any description, particularly the fermented wines and malt liquors.

Soda-water, root-beer, and Vichy water, may be used as beverages with decided advantage, and the more water that can be taken between meals the better, particularly rain-water, which is very bland to the stomach and a mild diuretic. It is always well for patients to take a full glass of water upon retiring, so that the morning urine may be less dense than would otherwise be the case.

Smoking is not objectionable.

The mind should be kept absolutely free from impure thoughts during the whole of the attack, and no sexual excitement permitted for a moment. The penis should be handled as little as possible.

This latter precaution must be strictly enforced for two reasons. In the first place, the constant pulling at the urethra, in order to see how much pus it contains and what its quality may be, is very irritating to the inflamed mucous membrane of the canal. In the second place, fingering the urethra exposes the eyes of the patient to inadvertent inoculation. The caution of extreme cleanliness and avoidance of the contact of any pus from the urethra with the conjunctiva should be very forcibly given to each patient, and frequently repeated and insisted upon.

As a final hygienic precaution it is well for the patient to carry his testicles in a suspensory bandage, since the tendency to epididymitis is in this way decidedly lessened.

All the hygienic precautions alluded to should be held in force during the whole course of an urethral discharge, and for a considerable period after its apparent cessation (a week to ten days), through fear of a relapse.

The medical treatment of urethral inflammation is regulated by the stage of the disease and the intensity of the symptoms. The first thing to be done in all cases is to see that the urine be made abundant and alkaline, so that it may be bland and unirritating in its passage over the inflamed surface of the urethral mucous membrane. To accomplish this dilution of the urine it may be enough to take an extra tumbler of water several times a day between meals, or of Bathesda water or of Vichy water. Should the dilution of the urine not materially reduce its acidity, some alkaline drug may be given well diluted with water, and administered during the third hour after each meal. If an alkali is given on an empty stomach before eating, the flow of acid during the next meal is pretty certain to be greater, and the result upon the blood of the alkali as a medicine to be proportionately diminished. If an alkali is given during a meal, its effect upon the blood is largely counteracted by the acidity of the digestive juices. Given during the third hour after a meal, the greatest amount of therapeutical effect is obtained from the least amount of the drug; consequently, when practicable, this hour should be chosen for the administration of the remedy.

The best alkaline drug, in cases of irritation of the bladder or urethra, is the citrate of potash. This salt, however, is unstable. In solution, after being kept for a time, it becomes changed to the carbonate of potash; and even in the dry state, if exposed to the air, it undergoes a similar alteration in part. The carbonate of potash, although a fair alkali, is not so good a diuretic as the citrate, and does not, as a rule, agree so well with the stomach. Finally, it may be well to state that the apothecary generally buys his citrate of potash in a bottle holding a pound of the powder; from this bottle he dispenses, and the pound may last him many months. In such a case all those served after the first few customers must necessarily get an inferior article.

Therefore, when citrate of potash is prescribed for a patient, it is well to order him, if possible, to procure his supply from a freshly-opened bottle, and to whatever quantity may be necessary, dry in the powder, in wide-mouthed ounce-bottles tightly corked. Along with his bottles, in a small drachm-bottle, he should receive a single dose, be it five, ten, twenty, or thirty grains, so that from his wide-mouthed bottle he may take out a portion equal to the sample for each dose, and may make a fresh solution in a claret-glass of water each time that he takes the medicine. In this way he will always have a fresh article, since by taking three doses a day he will use up an ounce before any of it has had time to spoil, if he keeps the bottle corked.

Occasionally the citrate of potash disagrees with the stomach, even when taken with all possible precautions. Under such circumstances it produces a sense of discomfort in the region of the stomach, perhaps nausea, possibly diarrhœa, and sometimes a pain in the head across the forehead. In these cases the remedy must be discontinued, and some other alkali tried, or Vichy water substituted.

The dose of the citrate of potash vaires from five to thirty grains. Just enough should be given to keep the urine constantly neutral or

slightly alkaline. If the citrate of potash cannot be obtained or disagrees, the bicarbonate of soda or of potash may be used, or liquor potassæ in sufficient quantities to produce the desired effect.

The means already detailed are of service in all cases; but, in selecting further remedies, some discrimination is desirable.

If the case is one in which there is reason to suspect that the discharge comes from a patch of damaged urethra, strictured or not, which has been excited to suppuration—where, for instance, a drop of pus appears at the beginning of the attack in a meatus which is not œdematous or swollen, in such a case there is generally no occasion for any further internal medication than the alkaline diuretics already alluded to. A very mild injection may be used at once, increased in strength every few days; and very often in a short time the supposed gonorrhœa subsides, and the patient rejoices in an escape from a prolonged sickness which he had perhaps looked upon as inevitable. The qualities of the different substances used for injection into the urethra will receive consideration presently.

In case the orifice of the urethra is pouting, indicating the probability of a commencing acute attack, the best substance to use in most cases in connection with the alkali is the oil of sandal-wood. The pure oil is very expensive, and what is sold is apt to be much adulterated, especially if bought at cheap drug-stores. Consequently, it is not advisable to order this remedy to poor people. The value of the drug is not therapeutically great enough to justify a poor man in preferring it to copaiba. The patient in good circumstances may take it in the form of capsules, or dropped upon a lump of sugar in increasing doses, commencing at ten drops at a dose, and working up to perhaps as much as thirty drops. One capsule is enough to commence with, and three generally as many as the stomach can bear.

Sometimes it may be desirable to give the oil and the alkali combined in a single prescription, such as the following, which is not unpalatable:

℞. Ol. santali..... ʒ ss.—i.
Liq. potassæ..... ʒ ij.—iv.
Syr. acaciæ..... ℥ i.
Aquæ fœniculi.....q. s. ad ℥ iij.
M.
S. Teaspoonful, well diluted, in the third hour after eating.

Sandal-oil agrees with most stomachs much better than copaiba. It produces no trouble upon the skin, and is not apt to excite diarrhœa. When it disagrees, it generally does so by causing intense pain in the back, over the region of the kidneys. In pushing the drug to obtain its full effect, it is well to continue increasing the dose until some uneasiness is complained of in this region, and then to interrupt it for a day or more, waiting for the pain to subside, as it does quite promptly. After this the drug may be resumed at an appropriate dose.

The effect of sandal-oil in full doses is usually soothing to the patient's sensations. In cases of ordinary urethritis it often promptly modifies the intensity of the discharge. In true gonorrhœa it is less effective, and sometimes seems to exert no influence whatsoever.

If the patient be poor, sandal-oil should not be thought of, but the balsam of copaiba should be used at once. If he be well-to-do, and the sandal-oil has helped him but little or not at all, then also recourse may *be had to* copaiba, which, although difficult to take and hard to digest, is

more efficacious in many cases. The balsam is inexpensive and therefore generally quite pure, no matter where obtained. It is put up in capsules by a number of manufacturers, and these capsules may be taken with the alkaline diuretic, commencing at a dose of one, and increasing until three or even four are taken at a time. The balsam may be given in combination with the alkali, in a prescription similar to the one already advised for sandal-wood oil, or in one of the following mixtures:

R. Bals. copaibæ..... ℥ ss.—i.
Liq. potassæ..... ʒ ij.—iv.
Syr. tolu..... ℥ iss.
Extr. glycyrrhizæ..... ʒ ij.
Aquæ menth. pip.....q. s. ad ℥ iij.
M. *Shake.*
S. One to two teaspoonfuls at a dose.

R. Bals. copaibæ..... ʒ iv.
Syr. tolu,
Syr. acaciæ,
Aquæ menth. pip.....āā ʒ viss.
M. *Shake.*
S. Teaspoonful.

The balsam may be administered in an endless variety of combinations, mixed with sandal-oil, with cubebs, solidified into pills with magnesia, and in countless mixtures. In general, the method by capsules is most convenient and palatable, since the drug is only tasted during the regurgitations in the throat, which are so constant and offensive in some people when they take copaiba. The odor of the balsam also remains on the breath, and is quite strong in the urine of the patient in all cases.

Copaiba disagrees with many patients. It causes acute indigestion in some, and more moderate dyspepsia in others. Sometimes it will not stay down at all, but is rejected by the stomach. Occasionally it produces headache and great depression of spirits. Sometimes it causes diarrhœa. The urine, when full of copaiba, may coagulate under heat in a manner suggestive of the presence of albumen.

Copaibal erythema.—One of the specific effects of copaiba is to produce an acute eruptive disorder, known as copaibal roseola or erythema. Its advent is frequently announced by a chill, with headache and nausea, sometimes by diarrhœa and considerable fever. The eruption is general, and consists of red raised blotches which itch intensely.

When the eruption appears, the urethral discharge becomes greatly modified, or ceases entirely, but it generally returns as the eruption fades.

The treatment of copaibal erythema is to give plenty of fluids by the mouth, and bland diuretics, to assist the kidneys in eliminating the offending substance from the blood. Warm baths are comforting, especially if they contain a little baking-soda—about one ounce to thirty gallons—or some of the infusion of bran, as in the ordinary bran-bath. Dusting the skin with starch-powder is cooling, and a few days generally suffices to so moderate the eruption that the itching is no longer distressing. On the first appearance of this eruption the copaiba must be stopped; but it may be resumed again, if it be desired, in smaller doses, after the eruption is well on the decline.

Copaiba is undoubtedly a very useful drug in the treatment of gonor-

rhœa. The very fact that it still continues to be used, in spite of its nauseousness, is sufficient proof of this. Yet it is not well to expect too much of it. It sometimes acts admirably in cases of urethritis, and is evidently comforting in many cases of gonorrhœa, but it does not, and it should not be expected to, jugulate the disease. By its effects it must be judged. It is valuable in the increasing and in the stationary period of the malady. If it gives a little comfort and checks the discharge somewhat, it should be continued, provided the stomach is not too much disturbed by its use. As soon as the stationary period draws to its close, and the discharge is fairly checked and positively on the decline, copaiba generally ceases to be very useful, and has to give place to cubebs.

Gurjun balsam, in drachm doses, twice a day, has been of late recommended in place of copaiba. It is said to be more agreeable to the stomach. It may be prescribed in mixtures similar to those in which copaiba forms the chief ingredient.

When the discharge commences to decline, cubebs, turpentine, iron and cantharides are the best remedies, of relative efficacy in the order given.

Cubebs may be administered as a powder, or in drachm-doses of the fluid extract. The oleo-resin is the most useful preparation, in my opinion, and that made by Merck, of Darmstadt, the best of its kind. Planten has put up this oleo-resin in capsular form. The dose is from ten to thirty minims, and it may be administered in various ways. Small quantities are easily taken upon a lump of sugar, larger doses best in capsules. One capsule at a dose is enough to begin with, to be gradually increased. Patients generally halt at three capsules at a dose, but sometimes they take four.

The effect of cubebs in moderate doses is rather to stimulate digestion and act as a tonic. The breath smells of it, and the urine is full of its odor. Large doses are distinctly irritating to the stomachs of most patients, and cause diarrhœa, with griping pain. If the neck of the bladder happens to be at all congested, or if the organ tends to be irritable, cubebs is generally harmful, since it aggravates such conditions, and, if pushed, may go so far as to bring on inflammation of the neck of the bladder.

Turpentine is sometimes useful in the declining stage of gonorrhœa, and may be given in those cases in which cubebs does not agree. The oil of turpentine may be taken upon a lump of sugar, in five- to twenty-drop doses, three or four times a day. If preferred, it may be given very conveniently in the form of the pearls of turpentine, as they are called—prepared by Clertan. The dose of these is from one to three.

Sometimes turpentine acts as an irritant, just as cubebs does, and induces frequent urination. In such case, the remedy must be changed or the dose lessened.

Iron, in the form of the tincture of the sesquichloride, is a time-honored remedy in the treatment of the subsiding stage of gonorrhœa, especially when it tends to become gleety. Besides the tonic properties of iron, this tincture is believed to exercise an especial influence over the genito-urinary system. The dose is from ten to thirty drops in water, three times a day, taken through a glass tube upon a full stomach. It is certainly very beneficial at times.

If iron makes the head ache or produces positive constipation, it is not likely to do much good to the urethral discharge. The constipating influence may be counteracted, however, by combining with each dose from *ten to* thirty minims of the fluid extract of buckthorn.

Tincture of cantharides enjoyed considerable reputation at one time as a stimulus in the last stage of a declining gonorrhœa. It is but little used at the present day, but yet there is virtue in it, and in obstinate cases it may be tried, taken pretty well diluted with water upon a full stomach, in from five- to twenty-drop doses.

When used in large doses this remedy also has a decided tendency to produce irritation at the neck of the bladder. Indeed, if taken in overdoses, it causes inflammation of the vesical neck quite certainly with strangury, bloody urine, etc.

The internal treatment of gleet is the same as that suitable for the declining stage of gonorrhœa, that is, if the gleet follows close upon a gonorrhœa and is its prolonged winding up. Generally, however, when a gleet prolongs itself after a gonorrhœa, it is either because the patient is too much medicated and cannot employ his stomach satisfactorily for its proper function, the conversion of food into a pulp ready for intestinal digestion, or it is because there is some local lesion in the urethra (stricture, prostatitis), or constitutional defect (debility, tubercle, gout).

Under these circumstances iron and turpentine are about the only internal remedies likely to do good. Wine should be given, a generous diet ordered, change of air and relaxation from work. Cod-liver oil sometimes has an excellent effect in these cases.

Local treatment is of the utmost value in these cases. The intelligent use of injections takes first rank where there is no stricture, and if the latter exist, even of very large calibre, its treatment should be undertaken at once as a proper treatment for the gleet.

THE USE OF INJECTIONS IN URETHRITIS.

Injections of the urethra are capable of rendering invaluable service in urethritis, but when inappropriately used they may occasion much mischief. The only safe rule for guidance in grading the strength of an urethral injection is to determine to get all the good that seems possible out of a given weak injection before resorting to a stronger one, and not to start with the idea that the urethra must be made to stand a strong injection in order that it may be forced into a rapid recovery from its lesions. No injection should be used in the urethra which produces any uncomfortable sensation lasting more than four or five minutes at the most. It is desirable in most cases to produce a warm, pricking sensation, which may become uncomfortable for a moment or two; but a positive pain generally means that some chemical violence has been done to the surface of the urethra, and such violence may be the starting-point of stricture.

It must also be remembered, in regard to a given injection, that if it does not do the good required of it, a different strength of the same ingredient in solution may have the desired effect. There is little, if anything, specific about injections. The reputation which hangs about certain proprietary injections is simply the glamour of mystery. When the composition of such an injection becomes known, it loses its great renown and takes its place among good injections, if it happens to be good, and there are a great many very good injections. A practitioner will learn all about a given substance if he uses it frequently, and it is advisable for him to stick to one or two substances and use them intelligently, rather than to employ a great variety of injections in the hope that, by skipping from one to another, he may hit upon some peculiar quality which his

patient really needs, but which he has not the wit to reason out beforehand.

It is well also to remember that, when a discharge ceases under a given injection, it may return promptly if the injection be abruptly discontinued. A discharge, indeed, cannot ever certainly be pronounced to have ultimately ceased until it has remained well for a week; and during this week of expectation the same injection should be continued which has been successfully employed, with this difference, that it should be diminished in strength from day to day, and used at longer intervals than during the cure.

A final precaution concerning injections is this: occasionally an injection produces and keeps up a discharge on account of being inappropriately strong. This is most apt to be the case with young men who often frighten themselves into a belief that they have a gonorrhœa when they have nothing of the sort, and commence a fierce onset upon the urethra with injections—a treatment which promptly excites a flow of pus and confirms their fears. On the other hand, at the close of a gonorrhœa, when an injection of considerable strength has been employed to arrest the purulent discharge, an oozing of gleety mucus may keep on, maintained by a strong injection the use of which has been persisted in.

In either of these sets of cases rapid improvement follows a cessation of the injection.

The method by which the urethra may be most conveniently injected requires a short description. Syringes with long nozzles are little used of late years, and several varieties of short-nozzled or conical-ended instruments are in the market, made of glass, hard rubber, and other substances. Any of these will do, but the hard rubber urethral syringe, known by the trade name of No. 1 A, is probably the best. Long-nozzled syringes have the disadvantage of scratching the urethra with their tips, against which the tender mucous membrane is forced by the pressure of the fingers clasping the urethra upon the outside.

Fig. 26 represents the No. 1 A syringe. Its bulbous tip only should be introduced into the urethra, in order to make an injection properly. It is a mistake to crowd the conical tip deeply into the meatus. This bruises the canal perhaps as positively as does the long nozzle of the old-fashioned syringe, the only difference being that the injury is done at a different part of the canal.

Fig. 26.

In using an injection, the latter should be slightly warmed, or at least the bottle should be kept in a warm place, so that its temperature may be but little lower than that of the body. Warming the syringe by holding it a moment in hot water will sometimes answer all purposes. In this way the urethra receives no shock from cold, and does not contract painfully upon the stimulating fluid which is thrown into it.

The syringe is filled with the warmed injection, and all air carefully expelled. The patient now urinates, washing the pus in this way from the inflamed surfaces. After the canal is fairly free from urine, the nozzle of the syringe is to be gently introduced just beyond the bulbous tip into the inferior angle of the meatus, and the two lips of the orifice are to be pressed against each other with the thumb and finger of the disengaged hand. The lips of the meatus are not to be pressed upon or *against the* instrument, but against each other. Now the canal of the

urethra must be very gently distended, by pushing the piston slowly home; the syringe may be at once removed, the injection retained about thirty seconds, and then allowed to escape.

These motions constitute the whole act in many cases. The quantity of fluid held by the syringe is not enough to penetrate into the canal farther than the bulb, and, in a capacious urethra, not as far. There is little chance of doing harm, therefore, by throwing the injection too deeply down the canal. After injections have been used for a time, it is allowable to manipulate the fluid in the canal, by holding the meatus shut with the finger and thumb of one hand, while with the fingers of the other hand, the fluid is pressed forward in the urethra so as to distend it, and backward, so as to make it penetrate more deeply. In so pressing back a fluid, the finger should never be carried beyond the penoscrotal angle, or the fluid may be driven back into the prostatic sinus and light up cystitis, or occasion epididymitis. A light injection used twice a day generally does more good than a strong injection used only once.

The time to use injections with most success is, when a discharge is upon the decline, after the height of the inflammatory stage has passed. In cases which commence deep in the urethra, where the meatus does not pout, injections may be used from the very beginning of the attack; in other cases it is better to wait and not to use them at all until the flow has begun to yield to internal medication.

A good injection to begin with is simple dilute lead-water. This is not apt to do any harm, and its effect is soothing.

Sulphate of zinc makes a standard injection of great value.

℞. Zinci sulph..... gr. ss.—iv.
Aquæ rosæ..... ℥ i.
M.

or the same strength of zinc may be used in combination with dilute lead-water. Such a mixture contains the white sediment of the sulphate of lead, which should be shaken through the mixture before the latter is used. This is a very old injection, and has given great satisfaction.

℞. Zinci sulphocarbolatis..... gr. i.—iv.
Aquæ..... ℥ i.
M.

is another injection possessing about the same qualities as the sulphate of zinc injections, but preferred by some patients.

℞. Quiniæ bisulph..... gr. ij.
Acid sulph. dil..... ♏ vi.
Aquæ..... ℥ i.
M.

makes an excellent stimulating injection.

℞. Pulv. aluminis..... gr. v.—x.
Aquæ..... ℥ i.
M.

is a fair astringent injection; a better one is a solution of tannin, at about the same strength. The tannin solution, however, has the great

disadvantage of staining the linen a brownish color, which will not wash out, and its use, therefore, calls for much care.

℞. Zinci permanganatis..... gr. ¼—ij.
Aquæ..... ℥i.
M.

is an excellent injection at the end of the gleety stage of a gonorrhœa. This injection is of a beautiful purple color and stains the linen, but the stain washes out.

Injections of iron are sometimes highly praised; the subsulphate, half a drachm in six ounces of water, is well spoken of by Bumstead, as a strong astringent at the end of the gleety stage. This also stains the linen.

Fig. 27.

Ricord's red wine injection must not be overlooked. Some patients use it with great apparent good effect. It is supposed to be tonic as well as astringent to the urethra. It is simply a mixture of ordinary claret with rose-water (or common water), commencing in the proportion of two parts of the latter to one of the former, and gradually increasing the relative strength of the wine, using of course, the same brand of red wine constantly. Finally, pure wine can be used.

Another pleasant tonic and gently astringent injection is tea. Tea infusion may be used just as it is brought on the table, undiluted, black or green tea. It is suitable in chronic cases of thin gleet, and is clean, always at hand, and much praised by some patients. It is actually a tannin injection, but more efficacious by far than a solution of tannin of similar strength.

Urethral suppositories made with cacao butter or gelatin are dirtier, and not so useful as injections.

When ordinary injections fail, deep urethral injections very rarely are of any service. Nitrate of silver and strong injections of tannin are sometimes used by the surgeon through a deep urethral syringe, a few drops of the fluid being deposited at that portion of the canal whence the discharge is presumed to flow. This plan cannot be generally recommended. The physician has to administer the injections, and as a rule very little assistance is derived from them. If deep applications are to be made, they can be used with much precision through the tube of the endoscope, or by means of the cupped sound.

The cupped sound (Fig. 26) explains itself. It is a simple conical steel sound, with hollow cups in its sides, into which may be placed any stimulating paste or ointment desired, and the cups then may be held against the area of inflammation at longer or shorter intervals, for a few minutes at a time, and the effect watched.

Generally, however, all cases calling for deep injections are either cases of stricture, or of prostatic surface inflammation. In the former case the stricture should be treated; for the latter, time, hygiene, change of air, and marriage are the appropriate remedies, and far more *serviceable* than deep injections.

One appliance of modern introduction calls for notice. It sometimes yields very good results. I refer to the instrument called the cold sound, and described by Winternitz,[1] of Vienna. Fig. 27 represents the instrument, which is simply a silver catheter with no eye and two orifices. The instrument is divided down the middle internally by a partition, which does not extend quite to the break, and the two canals therefore communicate freely at the tip of the instrument. To use the instrument it is only necessary to attach a fountain syringe containing water at the desired temperature to one nozzle, and a piece of rubber-tubing to the other. The catheter is then introduced past the seat of the urethral irritation, and the fountain syringe elevated so that there may be a continuous flow of water from the syringe down one side of the silver catheter and up the other through the rubber tube, and into a receptacle placed conveniently to receive it.

FIG. 28.

This instrument has been used in cases of neuralgia of the urethra, nocturnal pollution, and gleet. I have not thus far derived much benefit from it, excepting in the last-named condition. In gleet due to a flabby, atonic state of the urethra, and not dependent upon stricture, I believe this instrument to possess value. Winternitz uses it with a certain graded diminution of the temperature of the water employed. I have not found any advantage in this plan, but have adopted the simpler expedient of using water at the temperature of melting ice, and letting it flow slowly through the canal during five minutes on an average. On several occasions I have obtained an excellent result, but this method of treatment, as may be said of all the others advised for gleet, will not cure every case.

Finally, in cases of a gleety termination to a gonorrhœal flow, where the discharge will not cease under the means employed and there is no stricture, pressure exercised by the passage very gently, twice a week, of a full-sized steel sound, will often promptly terminate the case.

The dressings of the penis, when the urethral discharge is abundant, become a matter of importance. Some patients prefer to wrap the penis up in old muslin, retaining the latter with a light elastic band; but this is apt to slip off if the elastic be loose, or to cause erection if it be tight, and to soak through sometimes if the discharge becomes profuse. Some patients like a towel folded once or twice, and tied by a broad tape about the waist, so as to hang like an apron over the penis. This they tuck about the organ, and let the discharge soak up as it flows.

Bumstead thinks well of drawers cut like swimming-drawers, but this will not be enough protection when the flow is quite free.

One of the nicest dressings is what is known as a penis suspensory,

[1] Berliner klin. Wochenschrift, July 9, 1877.

Fig. 28. It is simply a waist-band holding a stiff little hoop, large enough for the penis to pass through, from the circumference of which hoop hangs a fine rubber bag. The bag is loose enough not to sweat the penis, and a piece of absorbent cotton is placed in the bottom of the bag to soak up all discharges. The only objection to these bandages is that they are flimsy and perishable.

Fig. 29.

Twisting a couple of sheets of thin water-closet paper about the penis is an efficient protection when the discharge is light. The paper stays in place much better than linen or muslin.

Finally, when the discharge is quite scanty, it may, without damage, be retained within the urethra, between the different acts of urination. This may be readily accomplished, when the prepuce is long, by putting some lint or cotton over the meatus, and retaining it in place by drawing the foreskin forward over it; and when the prepuce is short, by cutting in a piece of old muslin about three inches square a hole suitable in size, to allow the passage of the corona glandis through it. The foreskin is drawn back, the glans penis inserted through the hole in the muslin, and then the foreskin is again drawn forward, retaining the muslin, and so puckering it up around the meatus that the patient's linen is certain to be preserved from spot.

TREATMENT OF CHORDEE.

A certain amount of chordee is unavoidable in severe cases, and it is better for the patient to endure it with good grace, sparing his stomach any extra medication. He must keep up his alkaline diluents, and have some cold water near his bedside, or a piece of cold metal, which he may use locally upon awaking with a painful erection. Generally the simple emptying of the accumulated urine in the bladder is enough to cause the erection to cease, and with it the pain. The erection may come on again at once, however, as soon as the patient gets warm in bed, and it may be active enough to prevent sleep. In such case, medicine is called for. Sometimes, however, drugs may still be avoided by soaking the penis in intensely hot water just before retiring, and tying a towel around the waist with a knot in the back, for cases in which lying upon the back brings on the erection.

When chordee is violent enough to prevent sleep, it is best to commence with lupulin as follows:

℞. Lupulin..... ʒ jss.

Ft. pil. no. xx.

S. Take eight pills the first night. If this does not suffice, take twelve the second night. If this does not succeed, fifteen pills may be taken at a dose.

The objection to lupulin is that it is very bulky, and many patients will not take so many pills. The fluid extract is difficult to administer. The tincture is objectionable on account of the alcohol it contains. Moreover, lupulin sometimes causes diarrhœa, and makes the patient's mouth and stomach uncomfortable on the following day. Sometimes it causes a dull headache.

Bromide of potassium acts admirably upon some patients, but the dose given must be a large one. Dr. E. A. Banks, of this city, first brought this treatment to my notice. A drachm dose in solution of the bromide should be given on retiring, and this must be followed by another drachm if the first fails to attain the desired result.

The objection to bromide in continued use, from night to night, is that it often upsets the stomach, if the latter be delicate. It sometimes produces diarrhœa when used in large doses, and it sometimes brings out a red, scaly eruption upon the face, to which patients decidedly object. Hydrobromic acid may be used in some cases, but the dose is double that of bromide of potassium, and the effect upon the urine seems to be to acidify it, which is objectionable.

In bad case, final recourse has to be had to opium in some form. It is needless to add that the sooner this can be dispensed with the better.

Suppositories of a grain or more of the watery extract of opium may be used, made up with cacao butter or with wax, and introduced into the rectum on retiring. Codeine, or the meconate of morphia in camphor-water, may be given at night, in doses sufficient to counteract the pain when the latter is very intense. A laxative should accompany the opiate.

Dr. R. F. Weir, of this city, discovered, while treating a case of prescrotal urethral fistula by operation, that an elastic tube passed beneath the scrotum and penis prevented erection in the patient upon whom he employed it; the doctor's object being to keep urine from entering the portion of the urethra which had been operated upon—for the patient had an opening in the perineum also. I have tried this expedient upon patients in several cases of chordee, but I find them rarely willing to submit to sufficient pressure from an elastic tube to attain the desired result. One patient stood the pressure well and derived advantage from it.

TREATMENT OF PAINFUL URINATION.

Often the alkaline diluents and the sandal-oil or copaiba make the pain on urination tolerable; but sometimes it is so intense that the patient demands relief. This he may sometimes obtain by taking the bromide of potassium in moderate quantities, and if the drug does not disagree he may continue it during several weeks. The possible bad effects of a prolonged use of the bromide may be counteracted by combining it with the syrup of the bromide of iron, and the possible acidifying influence upon the urine may be neutralized by the addition of an alkali to the mixture as follows:

℞. Potass. bicarb. ..... ʒ iij.
Potass. bromid. ..... ʒ ij.—iv.
Syr. ferri bromid ..... ℥ ss.
Syr. aurantii corticis. ..... ℥ iss.
Aquæ. ..... q. s. ad ℥ iij.
M.

S. Teaspoonful in water, three or four times a day.

Hyoscyamus is a substance of great value in overcoming ardor urinæ. It may be given in the form of solid extract in pill, two or three grains three or four times a day, or in the shape of tincture, preferably combined with liquor potassæ, as follows:

℞. Liq. potassæ ..... ℥ss.
Tr. hyoscyami ..... ij.—iij.
Syr. zingiberis ..... ℥iss.
Aquæ cinnamomi.....q. s. ad ℥vi.
S. Dessertspoonful, two or three times a day, in water.

TREATMENT OF RETENTION OF URINE IN GONORRHŒA.

A perfectly healthy urethra may become so much inflamed by gonorrhœa, that, from swelling of the prostate and (chiefly) deep urethral spasm, retention of urine comes on. This result is much more apt to follow if the urethra was the seat of stricture, more or less tight, before the attack. Generally, when retention comes on during the acute stage of a gonorrhœa, the prostate may be felt through the rectum to be hot and throbbing, and the possibility of abscess of the prostate must be kept in view.

Not uncommonly retention complicating gonorrhœa may be promptly overcome by giving the patient a subcutaneous injection of ten to fifteen minims of Magendie's solution of morphine, and a hip-bath of water at a temperature ranging between 105° and 115° Fahrenheit.

Pieces of ice may be put into the rectum, and allowed to melt there, according to Cazenave's ingenious suggestion.

If other means fail, a soft catheter will generally reach the bladder without difficulty or danger If there be abscess of the prostate, a long, curved silver catheter will have to be used, and this will sometimes puncture the abscess and evacuate the pus, after which the urine will flow away without assistance.

TREATMENT OF VEGETATIONS.

Venereal warts, as they are commonly called, spring up readily in both sexes about the genitals, if any acrid and irritating discharges are retained until they have had time to decompose. These warts are common under a tight prepuce in connection with gonorrhœa, as well as with chancroid and syphilitic lesions, and are often found complicating balanitis when there has been no venereal exciting cause whatsoever. The warts are not the flat, pedunculated tubercles of syphilis, but are like seed-warts of the hand, composed of pointed, papillary prominences, either growing up into a raspberry-like mass, varying from the size of a pin's head to that of the end of the thumb, or spread out in a dry, velvety way over a large, flat surface. That the surface is composed of acuminated papillæ is as obvious in one form of the malady as in the other.

Treatment of these warts, wherever found and however caused, is quite simple. Cleanliness is a great prophylactic, and an essential to radical cure. When the general health is low, cod-liver oil and tonics are of value in obstinate cases.

Generally, local treatment is sufficient, especially if the warts be few

in number. In such case each separate wart may be touched with pure nitric acid. This turns the top of the wart yellow, and the yellow layer may then be picked off. The stump must be again touched, and the acid allowed to dry in. Another and another yellow layer may have to be taken away, according to the size of the wart. Finally, when the wart has been burned down even with the surrounding mucous membrane, one final drop of acid, to destroy the hypertrophied papillæ at their very foundation, will generally insure the patient against any further return of the malady upon that particular site.

When there are a number of warts surrounded by a moist discharge, no local treatment is so good as a plentiful and repeated dusting with dry calomel and washing the surface daily with diluted Labarraque's solution.

When the clusters are quite numerous, perhaps, more or less dry, an excellent local application is the saturated solution of muriate of ammonia.

Under the same circumstances, the local application, plentifully, of the saturated solution of thuja occidentalis, with ten- to sixty-minim doses of the same tincture internally, three times a day, will often affect the warts quite promptly, and cause their entire disappearance.

TREATMENT OF INFLAMMATORY PHYMOSIS DUE TO GONORRHŒA AND TO BALANITIS AND POSTHITIS.

Balanitis and posthitis are best prevented as complications of gonorrhœa by great cleanliness. When they come on, frequent washings become imperative; and when the foreskin is too tight to be drawn back, its cavity must be thoroughly syringed out several times a day, with a one-half of one per cent. watery solution of carbolic acid, or with some other cleansing fluid. If the foreskin can be retracted, the excoriated surfaces may be dusted with calomel and oxide of zinc, in equal parts by weight, and dressed with a piece of prepared lint soaked in diluted lead-water or some astringent solution, one of the best of which is the following:

℞. Vin aromatic..... ʒ iss.—iv.
Aquæ.....q. s. ad ℥ i.
M.

If the prepuce be congenitally narrow at its orifice, it is well to take advantage of the opportunity to insist upon the propriety of slitting it up along the dorsum if it is short, of performing circumcision if it is redundant. In the latter case care must always be taken in the adult that the cutaneous margin of the circumcised prepuce be amply loose. If it is not so, the cutaneous raw circle must be made larger by a cut along the dorsum of the penis, half an inch long or thereabouts, in order to change the small circle into a larger oval before the mucous membrane is stitched to the skin. A more elegant, but a little more troublesome method, is to leave the integument on the dorsum circular at the cut edge, and to make the half-inch incision along the raphe beneath the penis. Into the angle thus opened, a triangular piece of the semi-mucous membrane of the penis, including the frenum, and shaped with scissors to fit the gaping cut, may be inserted and stitched. The result in cases operated on in this way is particularly satisfactory.

If the prepuce is inflamed and not in a fit state for operation, but yet

phymosed, mild injections of lead and sulphocarbolate of zinc are appropriate. They should be used warm.

Inflammation of the prepuce involving its whole thickness is treated by putting the patient to bed, elevating the penis upon a compress placed on the thigh or abdomen (the penis should never hang down in these cases), and dressing at first with some soothing lotion, like—

℞. Liq. plumbi subacetat. dil. ..... ℥ i.
Spts. rect. ..... ʒ i.—ij.

which should be kept constantly applied, to be followed by an astringent, such as a solution of the glycerole of tannin in water, from one to three or four drachms to the ounce of water. The hard œdema of the prepuce sometimes following lymphangitis must be left to time to cure.

Paraphimosis complicating gonorrhœa is generally caused by œdema. The deeper parts are not strangulated and not likely to be, and there is rarely any occasion to attempt to reduce the prepuce. If it is considered desirable to replace the prepuce, this may be effected by wrapping up the swollen member in a rubber bandage long enough to squeeze out the œdema, after which reduction becomes quite easy. Sometimes a few coats of contractile collodion will keep down excessive œdema and comfort the patient, and sometimes a rapid disappearance of the œdema may be brought about by the constant application of a strong solution of tannin. Should the accident of positive strangulation of the penis occur, the strictured point must be divided with the knife.

CHAPTER III.

COMPLICATIONS OF GONORRHŒA IN THE MALE.

Inflammation of the Follicles of the Urethra.—Follicular and Peri-Urethral Abscesses.—Cowperitis.—Inflammation of the Lacuna Magna.—Death due to Gonorrhœa.—Gonorrhœal Cystitis.—Gonorrhœal Epididymitis.—Sterility following Gonorrhœal Epididymitis.—Treatment of Gonorrhœal Epididymitis, Prophylactic and Curative.—The Tobacco Poultice.—Strapping the Testicle.—Chronic Epididymitis.

BESIDES the common complications, chordee, balanitis, phymosis, etc., already detailed in the preceding chapter, there remain to be considered inflammation affecting the glands of the urethra, peri-urethritis, gonorrhœal cystitis, and epididymitis.

Inflammation of urethral follicles.—The follicles of the urethra always participate more or less in all acute inflammations of the canal. In chordee the follicles at the affected spot are certainly involved, and are probably the route by which the inflammation reaches the deeper tissues. These mild inflammations get well spontaneously, as a rule, when the surface congestion goes down.

In the prostate, however, this is not always the case. Here the irritation seems to love to linger in some cases after gonorrhœa, attended by an oozing of a gleety material from the prostate, perhaps a certain amount of irritability of the bladder, possibly pain during the ejaculation of the spermatic fluid, sometimes pain on crossing the legs, on sitting, on jolting. The symptoms may, indeed, much resemble those of stone in severe cases, when there is a certain amount of surface thickening of the mucous membrane of the prostate, as well as implication of its follicles.

These cases generally occur in broken-down phthisical subjects, or in those who inherit gouty tendencies.

Treatment is very ineffective. Bland alkaline drinks, tonics, regularity of life, change of air, and marriage, are the best means through which a final cure can be reached. These patients often imagine they have spermatorrhœa.

The same treatment applies when the symptoms show that one of the seminal vesicles has become the seat of inflammation, propagated from an inflamed urethra.

There are three other forms of follicular disease of the male urethra, all quite rare, but occasionally occurring as complications to urethral inflammation. One of these is the cystic abscess of small size, sometimes encountered near the fossa of the frenum in connection with gonorrhœa. The tumor is round, hard, painful, feeling like a shot or a pea as it moves under the skin beneath the fingers, and connected to the mucous membrane of the urethra by a long, thin peduncle, the obliterated duct of the gland.

These are little follicular abscesses. They should be cut out entire, or at least half of their circumference should be cut away while the wound is left open to granulate.

Inflammation of Cowper's glands, usually only one at a time, is another follicular inflammation of the urethra, but so rare in connection with urethritis as hardly to deserve mention. The symptoms are, at first, the appearance of a distinct hard swelling on one side of the raphe, making it painful for the patient to sit down. This soon changes into a diffuse inflammatory swelling involving the perineum and scrotum, more prominent on that side of the raphe upon which the inflammation began.

The treatment consists in poulticing and an early free incision, although resolution of this form of inflammation has been occasionally noted.

A third form of follicular inflammation said to be not uncommon, although I have never been certain that I could decide when it existed, is inflammation of the lacuna magna upon the roof of the urethra. Phillips is generally quoted in connection with this malady, and his advice that the pouch of the lacuna be slit up upon a fine director, when the malady can be located at this point, is generally endorsed.

Finally, peri-urethral abcesses are often the result of the spread of inflammation from inflamed follicles going on to suppuration.

Peri-urethral abscess is very rare with gonorrhœa. It is much more common in connection with stricture. With the acute malady it occasionally occurs at any point along the urethra, but preferably at the forward end near the frenum, or far back near the bulb. Free opening of these hard masses, well down to the urethral mucous membrane, before suppuration has occurred, is the best treatment. In the perineum fluctuation occurs promptly, and it is safe to wait for it, since there is no fear that the urethra will be extensively denuded in this region. If the abscess occurs within the capsule of the prostate, it generally opens into the urethra, or is opened during catheterism undertaken to relieve retention.

Fistula may be left behind by peri-urethral abscess, and a prolonged gleet by prostatic abscess, unless the latter has been detected through the rectum, and opened through the walls of the gut—an excellent treatment whenever a point of fluctuation can be felt in this region.

As an exceptionally rare complication of gonorrhœa may be mentioned suppurative adenitis in the groin. A certain amount of tenderness in the groin is very common in severe gonorrhœa, with more or less turgescence of the ganglia; but suppuration, although possible, is quite uncommon.

Death occurring during the course of an acute gonorrhœa may be due to pyelitis, Murchison reports two cases,[1] or to peritonitis starting from abscess in the seminal vesicles, or to some suppurative inflammation deep among the tissues of the pelvis, and due to gonorrhœa. Hunter alluded to this subject, and a number of cases have been reported, especially in the French journals. Faucon[2] has written an excellent article upon the subject recently.

GONORRHŒAL CYSTITIS.

An inflammation of the neck of the bladder is apt to come on in connection with urethritis under a variety of circumstances. It very rarely occurs spontaneously during gonorrhœa. Generally some immediate exciting

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[1] Transactions of the Clinical Society, London, 1876, p. 25.

[2] De la péritonite et du masculine phlegmon sous-péritonéal d'origine blennorrhagique. Archives gén., 1877, Oct., p. 385, and Nov., p. 549.

cause produces it. Among the most common of these are the use of strong injections, especially if thrown too deeply into the canal; strong and continued sexual excitement, or attempts at intercourse during a gonorrhœa; excess in physical exertion of any sort; abuse of liquor; excess in the use of cubebs, turpentine, or cantharides for the cure of the gleety stage of gonorrhœa; the use of instruments in the urethra at too early a date in the course of the attack, especially if there be any lack of perfect gentleness in manipulation during such instrumentation.

All of these, and certain other analogous causes, are sufficient to excite gonorrhœal cystitis in a patient having an urethral discharge, although the discharge itself may have become very mild and gleety, and much the more so when the discharge is intense. The same exciting causes are also sometimes productive of cystitis when the gleety urethral discharge is due to stricture, and not very infrequently an attack of mild cystitis comes on in a patient with a diseased urethra, the exact immediate cause of which cannot be determined.

Gonorrhœal cystitis is not commonly encountered until the urethral discharge has been active for several weeks.

Symptoms.—As the cystitis comes on, the patient at first makes water a little more often than usual by day (sleeping perhaps through the whole night), and the urethral discharge lessens, so that he congratulates himself that he is getting well. Soon, however, he finds that the calls to urinate become more imperative. On the call he must find speedy relief, or his bladder will contract partially in spite of his efforts to restrain it, and he may wet himself. Then follows pain on urination, and a sharp, grinding, bearing-down pain following each act of urination, due to the fact that the empty bladder continues to contract, and squeezes its own tender neck.

From this time on there is a constant sense of weight, a dull pain over the pubic symphysis, more or less heat and discomfort in the perineum, a constant sensation of fulness of the bladder, calling for repeated and unavailing straining to pass water, the best efforts culminating in a spurt of only a few drops of turbid urine full of pus and often tinged with blood.

Before this state has been reached the patient has become quite feverish, with dry tongue, parched lips, and constipated bowels. One peculiar quality of the fever attending inflammation of the bladder, rarely lacking in a well-marked case, is very serious depression of spirits. Patients with this malady are often more depressed, more anxious, less manageable than if they had a far more serious disease, although the fever itself very rarely runs high. The only consolation that they find is in the fact that their discharge has ceased, a comfort to which they have no valid claim, since a return of the show of pus at the meatus is generally one of the first and most certain signs that the cystitis has begun to get well.

Gonorrhœal cystitis generally gets perfectly well in a period varying from a few days in mild cases, up to a couple of weeks, or even several months, in bad cases. Sometimes permanent irritability is left behind, a circumstance which lends a respectability to the malady it would not otherwise possess.

Treatment.—When a patient with an urethral discharge commences to make water too often, the first thing to do is to search for the exciting cause and stop its action if possible. Give up injections and make the patient keep as quiet as possible in all physical respects. One precaution is this: the bladder should not be entirely emptied at any act of urina-

tion. Many patients cannot arrest the stream at will when the neck of the bladder is inflamed; but the attempt should always be made, and when it can be accomplished considerable benefit may be expected from this simple precaution. Much of the distressing pain after urinating can be averted if half an ounce of urine is left in the bladder; and in any case, if the patient must go on urinating until the bladder is empty, he should be told on no account to repeat the spasmodic voluntary effort of expelling the last few drops from the urethra which his malady inclines him to do. Once this "coup de piston" may be made, but it should not be repeated.

In mild cases, rest upon the back may be all that is required in the way of treatment, except the use of hot water, preferably in a rubber bottle, which affords considerable comfort when placed (partly filled, so as not to be too heavy) over the bladder or against the perineum, especially if the hips be kept raised slightly above the level of the shoulders.

Any stimulating balsam or tincture which is being given for the gonorrhœa should be stopped at once. The alkaline diluent should be continued, and bland drinks, like flaxseed tea, elm-bark decoction, infusions of triticum repens, buchu, arenaria rubra, etc., to afford the patient a little mental comfort, for certainly they do not do much good physically, excepting in so far as they are mildly diuretic.

Bathesda mineral water drunk freely is unquestionably of value in these cases, and an exclusive milk diet has a peculiar merit. The latter must be accompanied by enough of some mild vegetable laxative to overcome its constipating tendency. If it purges, as is sometimes the case, skimmed milk may be substituted for whole milk. A gallon a day is full diet for a healthy man. If so much can be managed by the stomach, nothing else whatever need be given either to eat or to drink.

All those articles of food and drink which were condemned in the dietetic section on the treatment of gonorrhœa must be equally avoided here (page 260).

Hot hip-baths are of considerable service in this affection. The heat of the bath should range in the region of 110° Fahrenheit, the pelvis should be covered by the water-line, and the bath be not longer than three or four minutes in duration. Such baths may be repeatedly taken every few hours during the day when they afford relief.

As for medicines, anodynes hold the first rank. The frequency of urination must be stopped, whatever happens. The old combination:

℞. Liq. potassæ..... ℥ss.
Tr. hyoscyami..... ʒiss.
Syr. aurantii cort..... ʒi.
M.
S. Teaspoonful in water every four hours.

will give relief in mild cases. The strength of the alkali in this prescription may be decreased, and that of the hyoscyamus perhaps increased with advantage. Hyoscyamus may be used alone, as tincture, in drachm doses several times a day, with the happiest effect in the cases in which it agrees. It must be remembered that hyoscyamus sometimes causes delirium.

When mild measures of this sort fail to control the frequency of urination, a positive anodyne must be employed. Half-grain or whole grain suppositories of the watery extract of opium, with a third to the half of

a grain of the extract of belladonna, may be used and repeated often enough to keep the intervals of urination two hours long. The belladonna sometimes disagrees.

Powders of morphine, like the following:

℞. Morph. bimeconatis..... gr. vij.—xiv.
Gum camphor..... ℈i.
Resinæ jalapæ..... gr. vj.—x.
Pulv sacch. alb..... ʒ ss.
M. Ft. chart. no. xx.
Put into waxed paper.
S. One, as required.

may be used for the same purpose, to keep the intervals of urination two hours long by daylight, or an analogous liquid preparation:

℞. Elix. opii (McMunn)..... ʒ vi.—xij.
Elix. rhamni frangulæ..... ℥ ss.—iss.
Syr. aurantii.....q. s. ad ℥ iij.
M.
S. Teaspoonful, as required.

By persistence in these means, the pain, the tenesmus, and the frequency of urination will gradually subside, and the discharge begin to reappear at the meatus. For this return, some mixture of copaiba (p. 263) should be used internally, since the effect of this drug upon the bladder is often also quite beneficial.

The patient must resume his habits of life slowly, and conduct the subsequent treatment of his gonorrhœa with great circumspection.

GONORRHŒAL EPIDIDYMITIS.

Epididymitis occurs quite frequently as a complication of gonorrhœa. Fournier places its frequency as high as twelve per cent., and Sigmund at between six and eight, believing that the left testicle is more often attacked than its fellow. Like gonorrhœal cystitis, it may come on in regular sequence as a result of the gradual spread downward of the urethral inflammation to the mouths of the ejaculatory ducts. Its most common date of appearance, during the course of a gonorrhœa, is the end of the third week.

The date of appearance of epididymitis, however, is by no means fixed. I have seen it come on during the first few days, as a result of irritating injections used to abort a gonorrhœa, and it may be encountered at any period later, or even at any time afterward during life, if stricture be left behind by the gonorrhœa. Stricture of the urethra, or rather the irritation so constantly existing behind it, is a fertile source of epididymitis.

Generally, epididymitis is due to some direct exciting cause over and above the general inflammation of the urethra. Among such immediate causes may be enumerated most of those irritants, general and local, which have been enumerated already as being capable of lighting up cystitis in a patient with gonorrhœa, such as injections too irritating in quality or thrown too deeply into the canal; the passage of a sound or other instrument, for exploratory or other purposes, down a urethra which is the seat

of surface inflammation; sexual irritation of any sort; drinking; violent exercise, which is generally believed to act by directly damaging the testicle mechanically, and thus, as it were, calling down the inflammation from the urethra. Hence the prophylactic importance of a snug suspensory bandage.

Symptoms.—When acute epididymitis is about to attack a healthy testicle, it generally takes at least twenty-four hours to get fairly under way. Sometimes signs of warning may be appreciated by the well-informed observer, even earlier than twenty-four hours before the testicle begins to swell. The first sign is generally an uneasiness referred to the depths of the groin, upon the side about to become affected, with a sense of weight and uneasiness in the testicle of that side, which is usually already somewhat over-sensitive to handling. With these symptoms there may be some general malaise, a little constipation, slight headache, a trifling fever.

These symptoms are quite apt to come on in the afternoon after a day of ordinary exercise. I cannot recall a case in which the first signs of epididymitis appeared early in the day, when that epididymitis appeared in due course as a complication of gonorrhœa.

The patient naturally keeps still with the pain in his groin or testicle, and the rest of an evening, or a night, or both, often makes him so comfortable that, upon awaking the next morning, he may not be conscious that he has any unusual pain until he is upon his feet—possibly not then—for there is no disease more apt than this one to stop unexpectedly at any point in its course, and thus to justify the most varied means of treatment. Indeed, after quite a marked prodromal stage, a night's rest sometimes dissipates the pains, and the patient becomes and remains well.

This fortunate result is rare. Generally, as the day goes on, the pain in the groin becomes more intense, the testicle rapidly or gradually grows heavy, hot, and painful, the enlargement commencing at the lower in the back part. There may be a sharp chill, followed by intense fever, nausea, headache, and vomiting. Constipation is uniform, and sometimes there is a tendency to frequency in urination, with more or less pain in the act.

Now the malady is fairly under way, and the testicle continues rapidly to swell. The flow of pus from the urethra becomes diminished, or stops entirely, to the delight of the patient, who indulges in the vain hope that that part, at least, of his misfortunes, at last is over. It is a kindness to undeceive him, and let him know that his relief from urethral trouble is only transitory, and that his discharge will surely return as the inflammation in the testicle subsides.

The fever increases, at first, as the testicle swells, and to the intense and increasing pain in the groin is added, often, an intolerable splitting pain in the back, low down. Meantime the testicle has increased in all its dimensions. A little fluid generally collects in the tunica vaginalis, keeping the testicle oval in shape as it increases in size. The scrotum gets red and hot, and is sometimes the seat of a very considerable œdematous effusion.

The intensity of the symptoms, and the height to which the inflammation is to run, vary greatly in different cases. There may be nothing more than a little tension of the testicle, most marked posteriorly, lasting only a few days, and totally relieved by the recumbent posture, if the testicle be at the same time elevated and supported. On the other hand,

the suffering may be intense, the scrotum hot, red, and shining, the pain in the groin and back excruciating, the tunica vaginalis tense and full of fluid, the substance of the whole testicle seemingly in a state of most active inflammation, and this condition is not relieved either by position or by support to the testicle.

First attacks of epididymitis, like first attacks of gonorrhœa, are usually much more formidable in their symptoms than subsequent visitations of the same malady. In the subacute form of epididymitis, especially in a testicle which has been the seat of former attacks, the whole malady may consist in a hard lump, which appears at the globus minor or major, attended by more or less pain, dragging, and constitutional symptoms. This lumpiness usually remains long present, perhaps for months, or even years, becoming, finally, almost or quite insensitive, and not responding at all to medication.

In the acute cases it generally takes from two days to a week for the increase in size of the testicle to reach its height, after which the swelling goes down—at first slowly, then quite promptly, so that in ten days or two weeks, under treatment, it may be counted upon with reasonable certainty that the most desperate case will be practically well—that is, free from pain to such an extent that it may be supported in a suspensory bandage, or at least strapped, and thus the patient be allowed to get about in comfort.

Sometimes, after an acute attack, a chronic induration of the epididymis remains behind for an indefinite period. Such testicles are rather prone to relapse. The cord may become involved, and the testicle itself become pseudo-tubercular, or even tubercular.

Sterility due to ordinary inflammatory epididymitis calls for a few words of notice here. An acute attack of the affection, if it passes over within a reasonable time, leaves no injury to the epididymis behind it; but the subacute attacks—those characterized by localized large nodular developments in the tail or head of the epididymis—are apt to fail to get entirely well, and as a consequence the convoluted tube constituting the epididymis becomes obliterated at the point occupied by the nodule, and the passage of spermatozoa through it becomes mechanically impossible.

The quality of the inflammation in epididymis seems to be plastic rather than catarrhal, although it commences in the lining membrane of the tube of the epididymis. The calibre of the tube becomes filled up as the morbid process advances, and the atmosphere of connective tissue in which the tubes lie becomes the seat of a similar plastic inflammation. This process thickens the whole epididymis by new connective-tissue deposits, and fuses together into a solid mass the convolutions of the canal of the epididymis. The canal shows irregular dilatations and contractions at the seat of the lesion; granulo-fatty degeneration may subsequently attack the whole mass, reducing it to a cheesy condition, in which even the contour of the tube of the epididymis cannot be made out. The name of Gosselin is generally coupled with this subject, since his investigations went far to clear up the pathology of chronic gonorrhœal epididymitis and to demonstrate the mechanical cause of the sterility which was known to exist in some of these cases after both testicles had been the seat of the disease. Gosselin pointed out that localized epididymitis of the tail of the testicle was more apt to produce sterility than when the head of the epididymis alone was involved in the disease, the reason being that many tubes unite to form the globus major, while the globus

minor is composed of the convolutions of a single tube—and unfortunately the globus minor is the peculiar seat of election of this malady.

The sterility encountered after gonorrhœal epididymitis is only present when both testicles have been diseased, and not necessarily then. This sterility has no connection with impotence. The patient's virile powers are as strong as ever, his sexual act perfect, his ejaculation satisfactory and full, and the testicle does not remain painfully swollen after sexual contact. Yet the fluid ejaculated is not healthy sperm. It has the spermatic odor, but is watery in quality, and apparently composed entirely of fluids from the seminal vesicles and from the prostatic follicles, for the most careful microscopic examination has failed to detect any spermatozoa in it. Consequently, such a patient is necessarily sterile, although he is not at ill impotent.

The treatment of this condition is unsatisfactory. It is believed that iodide of potassium, mild mercurials, and cod-liver oil internally, hasten absorption; but it is not well to place much faith in the curative action of these drugs. Time will effect a cure in some cases; it will fail in others. Possibly long-continued pressure might assist absorption and help to clear the tubes.

The most important medical bearing which a knowledge of this gonorrhœal sterility possesses is in its relation to the question of marriage. Many patients know that prolonged chronic epididymitis on both sides is liable to entail the loss of the power of procreation, and before marriage such a man may come to demand an opinion as to his capacity to beget a child. The only grounds upon which such an opinion can be honestly rendered are (presumptive) the existence of a lumpy indurated condition of the epididymis on both sides, and (positive) the entire and continued absence of spermatozoa from the spermatic fluid.

TREATMENT OF EPIDIDYMITIS.

The prophylactic treatment of epididymitis is very simple. A snug suspensory bandage should be worn, and all such exercise as might jolt or bruise the testicle must be strictly enjoined. The patient should be kept particularly quiet during the acuter periods of the urethral discharge, and cautioned against the least approach to sexual excitement. All those articles of food or drink which are known to increase the intensity of the urethral inflammation also tend to produce epididymitis, and must be avoided; and much care is necessary in the selection of proper injections, as well as in the manner of administering the latter. Finally, and above all, great circumspection must be exercised in using a bougie or sound for the cure of a retiring gonorrhœa. The patient should be prepared for the first introduction of such an instrument by taking an alkaline diuretic for at least twenty-four hours beforehand, and it is better, on the first introduction of an instrument, not to pass it entirely into the bladder, but only into the membranous urethra. The time selected for the passage of an instrument for the first time should be late in the afternoon or in the evening, and the patient should remain quietly at home during the evening and night. By the exercise of these precautions, it will rarely, if ever, be possible for the patient to accuse his surgeon of being the immediate exciting cause of his swelled testicle.

The curative treatment of epididymitis varies somewhat with the *grade* of intensity of the inflammation. During the premonitory twenty-

four hours, when the only complaint is of a slight weight or dragging at the cord in the groin, with perhaps some discomfort in the testicle and a pain in the back, it is proper to put the patient immediately to bed upon his back, to administer a brisk laxative, and to sling the testicle well up so that the cord may be entirely relieved from its weight, while the return circulation from the testicle is favored by gravity.

This slinging-up of the testicle is a most important matter during all stages of the treatment of the malady under consideration. It cannot be effected by means of the suspensory bandage. Such a bandage lets the testicle drop between the thighs, and, although it is very useful in the erect posture, it loses its value entirely when the patient lies down.

An excellent means of suspending the testicles is that employed in most hospitals. It is quite effective, but is unfortunately dirty, and confines the thighs to such an extent that most private patients will not endure it. In some cases, however, the method is very applicable. It consists simply in cutting a strip of ordinary adhesive plaster, four or five inches broad, and long enough to stretch from one side to the other over the tops of the two thighs, just beneath the scrotum, as the patient is lying down. It is applied by being fastened securely in place, the adhesive side sticking to the skin on the outer aspect of both thighs as they lie close together, the scrotum and inflamed testicle meantime having been drawn well up out of the way, to be afterwârd gently deposited upon the tense, smooth, dry table, formed between the thighs by the non-adhesive side of the plaster.

The plaster is dirty, the legs are constrained, the top of the plaster sometimes cuts into the root of the scrotum; but the bandage does not slip, and the support is quite efficient.

The best method of making support, and one which applies to all cases, whether or not poultices or other dressings are to be used, is the following: a large handkerchief is obtained—preferably of silk. This is to be folded into a triangle. At the centre of the long side of this double triangle, exactly opposite the right angle, a piece of tape about three feet long is to be sewed. An ordinary stiff roller-bandage, long enough to encircle the waist, completes the apparatus, which is to be arranged as follows: the roller-bandage is drawn quite snugly around the waist above the flare of the pelvic bones, and secured by safety-pins or by needle and thread. Then the patient is instructed to hold the testicles and scrotum well up above and over the symphysis pubis. The centre of the long side of the triangular silk handkerchief, marked by the tapes, is now placed in the perineum, well up against the root of the scrotum, and one end of it is carried up on either side along the fold of the groin, under the roller-bandage and over the same, after which both these ends are drawn upon, so as to make the long side of the triangle sufficiently tense under the scrotum, and then the ends are fastened into place with large safety-pins. Finally, the patient rolls on his side, and one of the tapes carried between the nates and under the roller-bandage, at the middle of the back, is knotted to its fellow in such a way as to keep the perineal portion of the handkerchief a fixed point. The right angle of the triangular handkerchief is to be loosely pinned up against the roller-bandage in front, to retain in place any dressing which may be put upon the testicle.

A bandage well arranged as above directed cannot slip, and gives more comfort than any other appliance with which I am familiar. All applications to the testicle may be made by its aid, excepting ice, and my

experience has caused me to condemn ice as a local application in all conditions of impending or actual epididymitis.

Certain authorities advise ice, and its application is very simple. It is only necessary to separate the thighs and place the inflamed testicle upon a suitable cushion, after which broken ice, floating in its own water contained in a bladder, or a rubber or oil-silk bag of ample size, is placed upon the testicle and cushion. Ice is useful in intense neuralgia of the testicle; harmful, I believe, in most inflammatory conditions.

Numerous internal remedies have been at various times advocated in the treatment of epididymitis. None of them have held place. The continued nauseant influence of frequently repeated small doses of tartar emetic has proved of no value in my hands. Pulsatilla has been loudly vaunted of late, splendid effects being stoutly claimed for it in doses of one-tenth of a minim often repeated, up to one drop three times a day. It has failed in my hands, employed in both ways, either to check the pain or modify the course of the malady. I think well of correcting the strong tendency to constipation, which always exists in the disease, by the daily use of gentle laxatives; and on the few occasions where the pains demand it, I see no objection to the administration of a small amount of codeia or other gentle anodyne. Beyond this I cannot recognize any value in internal medication.

As for the local heroic measures, but three require mention: bleeding, puncture of the tunica vaginalis, and puncture of the tunica albuginea.

Leeches upon the scrotum do not afford any considerable relief, according to my experience, and are attended by obvious disadvantages. Where the testicle seems to be strangulated by the intensity of the inflammation, a large number of leeches—ten to twenty—placed over the upper part of the scrotum and along the course of the cord, will sometimes afford relief from the immediate and excruciating pain; but puncture of the tunica vaginalis, or of the albuginea, will afford similar relief at a less cost of blood, and consequently of vitality.

Puncture of the tunica vaginalis.—In all acute cases of epididymitis there is more or less effusion of serum into the cavity of the tunica vaginalis, making an acute hydrocele, the size of which is sometimes considerable, generally unimportant. When the tension within the testicle is great, and the effusion considerable, relief may sometimes be promptly afforded the patient by resorting to puncture of the tunica vaginalis. A number of punctures may be made subcutaneously with a fine, sharp-pointed knife, so that the fluid may escape into the meshes of the connective tissue of the scrotum, or the serum may be drawn off by the modern process of puncture and pneumatic aspiration. After aspiration the cavity may refill, but often the acuteness of the pain subsides after a single puncture, and the subsequent collection of fluid may be disregarded. When the tunic is not distended, its puncture does not afford relief—as might be inferred.

This operation is entirely devoid of any risk or danger, and is justifiable under all circumstances of distention of the tunica vaginalis in connection with acute inflammatory disease.

Puncture of the tunica albuginea.—In connection with epididymitis, the secreting structures of the testicle within the tunica albuginea may become congested and distended to such an extent as to produce the intolerable pain of acute orchitis, a pain felt intensely in the testicle and radiating thence up the cord, along the groin, and into the small of the *back.* This pain may often be relieved at once by a single subcutaneous

section of the tense tunica albuginea to the extent of about one-third of an inch, or even less. The operation is a simple one. A sharp-pointed tenotome is introduced obliquely under the skin of the scrotum, and the tunica vaginalis entered; then the blade is made to advance flatwise within the cavity of the tunica vaginalis for a short distance, after which it is turned so as to present its cutting edge to the tense tunica albuginea, the testicle being steadied by the operator's free hand. Finally, by a deliberate puncture upward followed by a slight incision on withdrawing the knife, the incision to lie at about the centre of the forward part of the tunica albuginea, a slight cut is made in the tense tunic, and the little operation concluded.

It is doubtful whether any harm can follow this surgical manœuvre. In a recent spirited contest upon the subject, between the English surgeons, it was claimed, on the one hand, that this method of cure was wonderfully rapid and absolutely harmless; while, on the other hand, it was maintained that the damage inflicted upon the testicle sometimes caused its ultimate atrophy, and that the incision did not always either cure the pain or shorten the natural duration of the malady.

It is hard to conceive how such a puncture as has been described can really injure a testicle, and it seems probable that those cases in which atrophy of the testicle followed puncture were instances of true orchitis, which, as is well known, frequently goes on to atrophy of the testicle when no puncture at all has been resorted to. Still, in face of the possibility of any ultimate blame attaching to the surgeon, in case of any damage to the testicle, if puncture has been employed, it is well to resort to this procedure only after mature consideration, and after ordinary means of stilling the pain have failed.

Multiple minute punctures of the tunica albuginea, made with a large surgical needle or the point of a fine, straight bistoury, answer often as well as section of the tense membrane, and are probably attended by less risk of doing harm.

The sheet-anchor of treatment in epididymitis, however, is position of the testicle, and, next to this, the local use of hot fomentations of the narcotic sort. Belladonna and opium in different forms, as hot decoctions and infusions, have been employed largely, but they are not devoid of danger, and possess little advantage over tobacco. Tobacco is undoubtedly a filthy substance, but, with care, it may be so managed that the patient is little, if at all, soiled by it. As to danger, there is practically none. Thin-skinned persons, who have never smoked, may absorb enough of the poison to become faint, pale, nauseated, and dreadfully depressed; but, if they are informed of the possibility of these occurrences beforehand, and remove the tobacco when the objectionable symptoms first begin to appear, the inconvenience soon passes off, and there is no possible danger, either to life or to subsequent health. Excoriations of large size upon the skin of the scrotum contraindicate the use of any narcotic or anodyne in the poultices, which must then be composed of some simple material.

To make a tobacco poultice, which shall be at once efficient and clean, the following course may be followed: one ounce (a paper, as ordinarily sold for chewing) of fine-cut tobacco is to be finely shredded into a tin or earthen vessel, containing from eight to ten ounces of boiling water. Into this is put a tablespoonful of glycerine or of sweet oil, and into the whole, while being rapidly stirred, is mixed a powder of equal parts of ground elm-bark and ground flaxseed, in sufficient quantity to bring the whole mass to the proper consistence for a soft poultice.

A square piece of oil-silk, or of thin rubber-sheeting, two or three times the size of the proposed poultice, and containing a hole at a suitable place, through which the penis is to protrude, is now to be laid upon a flat surface. Upon this a doubled piece of cotton cloth, considerably larger than the proposed poultice, is to be placed. Upon this cotton cloth the tobacco mixture is poured, so as to make a poultice not less than one-quarter nor more than half an inch thick. The mass should be about as consistent as mush, and the liquid parts not in such excess as to be visible. Upon the top of this mass, after it has been rapidly smoothed down and squared off, should be placed a single thickness of some gauzy material, a little larger in all directions than the tobacco mass, and, finally, the four edges of the doubled cotton cloth should be turned in twice upon themselves, in such a way as to enclose the poultice and the gauze upon it all around, in a frame, as it were. The attachment of a few points by needle and thread complete the poultice.

The poultice when made should be perfectly moist, soft, and smooth, but should never drip. It should be large enough to cover the entire testicle—indeed, the whole scrotum. Both testicles may be taken in with advantage. The poultice must be applied as hot as it can be borne, with the rubber cloth or oiled skin outside of it, the whole to be sustained by the handkerchief-sling, described on page 283.

Such a poultice, so made and applied, will keep hot and moist for a long time, and in the hands of a careful person is not at all dirty. If a little moisture should drip away, it can be easily caught in a couple of folded towels or a sheet beneath the buttocks. Two such poultices in the twenty-four hours are generally sufficient. A tobacco poultice may be sprinkled with powdered opium or with laudanum, or mixed with oleate of morphia, on the start, if an extra amount of local stupefying influence over the pain is desired.

I think it well in all cases bad enough to confine the patient to bed, that such a poultice as the one above described should be applied at once as soon as the testicle is suspended. It often succeeds in stupefying the testicle within a few hours and entirely overcoming the pain. In all very acute or intense cases, however, this effect cannot be expected before the lapse of two or three days, possibly longer.

The vast majority of cases of epididymitis call for no further treatment than the simple means already enumerated: mild laxatives, an elevated position of the testicle with the patient upon his back, and a well-made tobacco poultice. Under these means the acute symptoms pass off in a period varying from a few hours in mild cases, to a few days, all pain disappearing at the very outside in two weeks, in the worst cases. Generally the patient who lies down at once, even with a very severe first attack of the disease (which is the worst he can have), may be promised that he will be out and attending to his business in ten days, and this period under good management may often be shortened to a week, while cases which last only from twenty-four hours to three days are by no means uncommon.

When the acute symptoms are over, however, the patient is not well. The pain usually subsides entirely in from one to three, or possibly five or six days; but, long after the patient ceases to feel pain, any handling of the still swollen organ makes him wince, and an attempt to remain long in the erect position brings on acute pain. Therefore, if the patient wishes to avoid relapse, he must not presume to go about his business until he can stand with the tesicle unsupported for at least fifteen minutes *without* experiencing any pain. When he can do this, he may go with

his testicle well supported in a snug suspensory, inside of which is a piece of thin rubber and a piece of prepared lint, smeared, perhaps more for form's sake than anything else, with some indifferent ointment.

STRAPPING.

Should a patient find it necessary to leave his bed before completing his week or ten days, and not be able to wait until he can stand erect for fifteen minutes without pain, he may do so by the aid of strapping. Just as soon as the acute symptoms are fairly on the decline and the testicle can be handled, even although it be with pain, the patient may get up and go about with safety, so far as relapse is concerned, if the testicle be properly strapped. Strapping should be first done at night, and the first straps should be put on with great gentleness and not too tightly. The patient must be directed to stay in bed all night, and to remove the straps or to cut them down the front, if the testicle be not quite comfortable in half an hour after the straps have been applied.

An effectual method of applying straps is the following: a number of strips are cut from a roll of fresh adhesive plaster, ranging about ten inches long by three-quarters of an inch wide. If the plaster be not very fresh, an assistant is necessary to warm the strips of plaster one after another, and hand them to the operator. The patient sits upon the edge of the bed, with his thighs stretched wide apart. The operator, upon a low chair, sits directly in front of him, seizes the enlarged testicle gently with his left hand above the globus major, and, by a motion at once rotary and constricting, under gentle traction he pulls the testicle down until he can easily encircle the cord above with his thumb and index finger.

The sound testicle meantime slips up upon the opposite side, and the whole scrotum is pinched in about the neck of the swollen testicle, and held there for a moment with the finger and thumb of the operator's left hand, until the parts become used to the traction and the tension. Now a piece of prepared lint, previously cut long enough to surround the top of the testicle and about one and one-half inch broad, is placed under the index finger and thumb posteriorly and brought forward so as to surround the neck of the testicle, while its free ends cross in front and lie below upon the body of the tumor.

The object of this lint is to prevent the cutting to which the tight top strap subjects the tender integument of the scrotum. After it has been satisfactorily adjusted, the first adhesive strap is to be placed. This is done by holding the two free ends of the lint with the underlying scrotum tightly about the neck of the tumor, while the centre of the adhesive strip is placed posteriorly upon the centre of the strip of lint. One end of the adhesive strip is now brought around, following the centre of the strip of lint, and attached to the integument of the scrotum beyond the lint. Finally, the other end of the adhesive strip, also following the centre of its half of the lint strip, is brought around under considerable pressure and attached either upon the half of the adhesive strip already placed, or crossing the latter upon the integument over the tumor below.

Upon the successful laying of the top strap depends the success or the failure of the whole strapping. If it does not lie smoothly and retain the testicle tightly, it is well to remove it and put on another. How tight it must be is of course a matter of judgment; but the tendency certainly is to make it too loose, and it always seems to be tighter than it is on account

of the shining, tense, purple look of the scrotum beneath, if it be allowed to remain a moment, due to the arrest of the return circulation in the veins.

To place the other straps is now an easy matter. Each one is to be started posteriorly, and to overlap the one above by half or even two-thirds its breadth, and each half of each strap is to be brought around under considerable tension, preserving its relation to the upper strap, attached, and cut off at a suitable length.

Going down the testicle, the straps are made to lie more and more in a circular direction, until finally a strap is placed which leaves the egg-shaped end of the livid scrotum projecting beneath it, not covered, but yet incapable of receiving any more circular straps. If any of the circular straps now prove so tight as to push the testicle up through the constricting ring formed by the top strap, the dressing is worthless, and must be reapplied. If, however, the testicle is tightly held, its remaining livid extremity may be bound in by a number of short, broad straps very tightly applied from behind forward, and laterally, until the whole of the testicle has been covered in.

These last straps are quite important. They cannot be put on too tightly, and, to place them at all properly, the testicle has to be squeezed enough to give the patient a great deal of pain. Outside of these final straps another circular one may or may not be placed, according to taste, and the strapping is complete.

When a testicle, after acute inflammation, is snugly strapped for the first time, it is apt to throb and grow painful for a time. If, at the end of half an hour, the patient lying down, the pain has gone or is subsiding, the strapping is efficient and may be left in place. Long before morning the testicle will have become perfectly comfortable, and the patient may go around at will through the day, wearing an ordinary suspensory bandage or continuing his handkerchief-sling, without fear of relapse and without feeling pain. If, on the contrary, half an hour after the straps have been applied, the pain is on the increase, the straps must be removed or cut down the front, or the pain will continue, will grow insufferable, and probably prolong the whole attack of epididymitis many days by reason of a fresh onset of inflammation. In any case, if the pain be intense after half an hour, the straps have been improperly applied, and have done harm instead of good.

The first strapping, if a good one, should last forty-eight hours. It may be most conveniently removed by the patient in a hot bath. After the straps become thoroughly soaked in the water, they come off readily, and then a little soap and water does all that need be done toward removing the adherent plaster.

New straps should be applied at once as tightly as the first, or even more tightly, to overcome the œdema which is sure to be found at the bottom of the scrotum, replacing within the strapping whatever bulk has been lost by the testicle. These second straps may remain on for three days, when, usually, none further will be needed.

CHRONIC EPIDIDYMITIS.

In successive gonorrhœas, or in connection with stricture or other urethral inflammatory affection, partial epididymitis often comes on, especially in a testicle which has once been the seat of acute inflammation.

In these attacks the symptoms are usually quite moderate. The hard lump at the tail (usually), or in the head of the epididymis, sufficiently discloses the nature of the disorder and the cause of the pain.

These cases are generally easy to manage. A few days' rest, even without poulticing, often makes the pain so tolerable that a little warm swathing in a suspensory bandage allows the patient to get about.

Mercurial ointments and iodine are of little value in these states. The main reliance is to be placed upon curing the cause and getting the urethra into good condition. Instrumentation within the urethra, and injections, are to be avoided until tenderness has left the testicle. As good a local application as any in these cases is the oleate of morphia rubbed up with fresh stramonium ointment, one part to two. It makes a soft, oily mass, which may be applied on lint inside of the thin rubber which the suspensory bandage surrounds.

The treatment of the sterility following epididymitis has already been considered.

The question of abscess following localized epididymitis, and of pseudo-tubercular disease of the testicle, is out of place in a work of this character.

CHAPTER IV.

STRICTURE OF LARGE CALIBRE.

Stricture of the Male Urethra.—Spasmodic Stricture.—Examples of this Form of Stricture.—Stricture of Large Calibre: Symptoms, Diagnosis, Treatment.—Resiliary Strictures of Large Calibre.—Internal Urethrotomy in the Pendulous Urethra, the Limit of the Cut, the Result, and the After-treatment.

A VERY common result of gonorrhœa in the male is the formation of stricture of the urethra. Stricture may be due to many other causes, such as trumatic violence of any sort, mechanical or chemical, especially any kind of bruising of the canal transversely; or to congenital imperfection of the urethra, particularly common at the meatus; or to spasmodic action of the muscles of the deep urethra, sometimes reflex; yet all these causes combined only yield a small proportion of the cases of real stricture—stricture producing symptoms as encountered in ordinary practice. Many cases of gonorrhœa get well and leave the urethra sound, even although the urethral inflammation has been intense and prolonged. On the other hand, many cases of mild urethritis, which are not due to gonorrhœal poisoning and have never run high in the suppurative stage, prolong themselves indefinitely in the shape of a gleet, and exploration of the urethra demonstrates that there is a tight place in the canal yielding a tinge of blood to the exploring instrument, manifestly excoriated upon its surface, and clearly the lesion whence proceeds the oozing which constitutes the gleet.

The question of spasmodic stricture is so interwoven with that of organic stricture, that neither of them can well be considered apart from the other; and although, accurately speaking, stricture of the urethra is no more a venereal disease than uræmia is scarlet fever, yet it is so closely related in many ways to gonorrhœa that its description naturally falls into place here, and the various forms of stricture call equally for a certain amount of detail.

I shall describe the three forms of stricture inversely as to their importance, taking up first the spasmodic stricture, next the stricture of large calibre, and, finally, the stricture of small calibre.

SPASMODIC STRICTURE OF THE URETHRA.

The existence of spasmodic stricture of the urethra has been doubted, but it plainly is a reality, as may be easily demonstrated. It is indeed the least venereal of all strictures, and may depend upon a multitude of causes, general as well as local, moral as well as physical. Moreover, it may complicate either of the other forms of stricture and give to them an importance which they would not otherwise possess. In this way spasmodic stricture earns for itself a right to respectful consideration; its existence cannot be ignored.

Spasmodic stricture is generally capable of very easy demonstration. A personal case will well illustrate this.

A young man, under twenty years of age, and perfectly healthy so far as urethral or antecedent venereal disease of any kind was concerned, finding some pediculi upon his pubis, was kindly supplied with a lotion by an obliging friend, with which to kill them. This he applied faithfully in the morning. The lotion, which proved to be simple tincture of staves-acre, proved quite irritating, and presently occasioned much tingling and burning of the skin where it had been applied, and brought on a desire to urinate; but the patient to his surprise found that he could not void a drop of urine, the bladder being only slightly distended.

He continued up and about all day, making repeated but absolutely futile efforts to empty his bladder, and finally was brought to my office for relief late in the afternoon. I at once passed a full-sized olivary soft catheter into the bladder, encountering no obstacle, and a clear, bright stream of urine gushed out in torrents through the instrument to the amount of more than a pint.

The patient passed water voluntarily in the evening before retiring, and has had no further trouble.

This case was certainly one of spasmodic stricture of the muscles of the deep urethra, due to irritation reflected from the skin. There was no present or past malady of the bladder or urethra, and has been none since. Efforts were made in vain by the patient to empty his bladder during all stages of fulness. There was not a particle of atony in the case, for, as soon as the urine found a hole from which to escape, it gushed forth under the powerful contraction of the detrusor, and did not dribble away sluggishly from the end of the catheter, as it is wont to do in cases of atony, unless aided by the efforts of the abdominal muscles. The stream in this case continued with equal force and vigor up to the last few drops. Here then is a case of pure reflex spasm of the urethra.

In the autumn of 1877 an old man applied to me for relief on account of frequent, painful, and imperfect urination in a small stream, his symptoms being particularly troublesome at night. He squeezed out a few drops of urine in my presence, in a small stream and with great pain. The urine was clear and sparkling, of normal reaction.

The patient was very thin, and percussion and palpation over his abdomen quickly made it apparent that the bladder was fully distended. The natural inference in the case of this old man was that he was suffering from prostatic overgrowth and atony. I told him that I should endeavor to introduce a catheter, and should draw off a portion only of the contents of his bladder. I introduced a soft rubber English catheter of full size. It halted sensibly for a moment at the membranous urethra, and then slipped rapidly into the bladder; but before its eye had reached the cavity of the bladder, urine began to pour tumultuously out, both through the catheter and along the outside of it. So violently did the urine flow, that it was with difficulty the catheter could be retained in the bladder to allow part of the flow to escape through it, and even this was finally abandoned, and the rushing stream of urine swept the catheter out of the urethra, and followed in a continuous stream of full size and force until every drop had escaped from the bladder. Of this I satisfied myself by reintroducing the instrument. The urine was of the best quality, perfectly bright and clear. Surely there was no valve here, no prostatic lobule, no atony—nothing but spasm of the deep urethral muscles.

The old man's urethra was perfectly healthy as to any present or past

inflammatory disturbance, and in seeking a cause for the retention, I found that his rectum was in trouble. He stated that he had had hæmorrhoids for several years, but he begged me not to examine them, saying that he was using an ointment as a suppository which gave him relief, and that he did not desire to do anything else, and would not be examined. I could not overcome his scruples, and had to wait for developments.

Meantime the old man got a soft catheter, and used it when he had retention. It was only necessary to start the urine by introducing the catheter up to the neck of the bladder, after which, on each occasion, the urethra performed its function perfectly. For many days at a time he would pass his water as well as any one, and then suddenly, without obvious cause, retention would again overtake him, and perhaps persist for a day or more—or pass off, if the catheter was promptly used.

I soon got access to this patient's rectum, and found it to be the seat of epithelial cancer just beginning to ulcerate. The prostate was not enlarged. Here then was an explanation of the spasmodic stricture.

The case was not a fit one for operation upon the rectum. I watched the patient for about a year, when he died from progress of his cancer, which involved the sphincter and the neighborhood of the anus, but never touched the bladder or urethra. Urinary symptoms continued in an intermittent way until the end.

In 1868, Dr. Van Buren snipped off one small tab of skin—the result of an external hæmorrhoid—not at the time at all inflamed, but simply annoying by its presence. The patient was an old gentleman in the best of surroundings. He took no ether for the little operation, and the sphincter was not stretched. His urinary organs were in perfect condition. For five days after this trifling operation he could not urinate, and a soft catheter had to be introduced three or four times a day. After this he got well, and did not use a catheter again until his death, which occurred some years later.

In 1876, I stretched the sphincter, under ether, and tied off some internal hæmorrhoids in a man under middle age. From the moment of the operation until the eleventh day, not one drop of urine could this patient void spontaneously. A catheter was in constant demand. His urethra was sound, and he became and continued well, after the soreness left his rectum.

Dr. Emmet has seen a case where necrosis of the coccyx produced spasmodic stricture of the urethra; and Verneuil a similar condition, due to abscess in one of the seminal vesicles. I have two personal cases where stricture of this sort was due to reflected irritation from a chronically inflamed seminal vesicle, and notes of a number of other cases due to the most varied causes.

Tuffnell's case is well known, where a patient had a stricture deemed impassable (doubtless because fine bougies only were used in attempts to pass it). This patient suffered so much, that a day was appointed upon which perineal section should be performed; but, before the date arrived, he passed some links of tape-worm, unsuspected before, and, as a part of the preparation for his operation, a medicine was given to dislodge the worm. This proved successful. The worm was passed, and with it the impassable stricture disappeared, and the patient urinated freely at will.

It has occurred several times, in my experience, for a surgeon to make a diagnosis of tight stricture in a given case, and to find his filiform

bougie—which he has passed with difficulty—grasped, as he attempted to withdraw it, when there has been nothing more in the case than spasmodic stricture of the deep urethra, as proved by the fact that a well-warmed, large, blunt steel sound, held gently against the face of the obstacle, has, after a short delay, slipped, by its own weight, smoothly into the bladder.

The medical journals, and surgical books and theses of the past as well as the present day, contain plentiful examples of spasmodic stricture. Dartigues, in his Thesis (Paris, 1873), quoting Hippocrates, Malgaigne, Cooper, and others, as authority, refers to many cases of retention from spasm of the urethra following various surgical injuries, such as luxation of the hip forward, amputation of the thigh (five cases), ablation of the breast, breaking up of anchylosis of the knee. The influence of a tight meatus upon the deep urethra, of phymosis, of irritations in the kidney, and of other more distant lesions, have claimed attention from time to time. Reflex phenomena, as affecting the urinary organs and caused by them, have received a certain share of attention. (Civiale and others have called it sympathy). Prof. Sands has collected, from the older writers before the time of Civiale, a number of interesting instances of lesions involving the urinary organs as cause of distant troubles (Home's case of sciatica, due to stricture, being perhaps the most striking), and a few of urinary troubles due to perineal irritation, one of these being strangury induced by teething, in a boy, and relieved by cutting the gums. (Hospital Gazette, May 3, 1879, p. 132.) Verneuil, in France, in 1866, before the Anatomical Society of Paris, pushed the spasmodic theory so far as to claim that most strictures were to be found in the forepart of the urethra, and not deeper, as had been taught—many of the supposed deep organic strictures being only spasmodic strictures due to irritation in the forepart of the canal. Folet[1] followed his master in establishing the new doctrine.

Otis,[2] in this country, has generalized, from his own experience, laws still more positive than Verneuil, claiming that organic stricture is very common forward, and quite infrequently occurs in the deep urethra, spasm being at the bottom of most of the so-called tight organic strictures in this region. Dr. Otis's first publication on the subject was in 1873.

These gentlemen have, however, as yet failed to convince a majority of the sober-minded men in the profession, either by their cases or their arguments, that spasmodic stricture of the deep urethra is so common, or organic stricture so rare. As stated by Sebeaux,[3] Verneuil's law is the following: all spasmodic strictures due to irritation of the urethra are situated in the membranous portion of the canal; if due to irritation above the vesical neck, on the other hand, the stricture lies in the posterior vesical sphincter, which is composed of unstriped muscular fibre. Robin and Cadiat state[4] it as their belief that the spasm lies always in the unstriped, never in striped muscular fibre; but they do not appear to me at all to demonstrate their position. The fact that females have re-

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[1] Études sur les rétrécissements péniens de l'uréthre. Archiv. gén., 1867, Vol. I., p. 424.

[2] Radical Cure of Stricture of the Male Urethra. New York, 1878.

[3] Contracture du col de la vessie. Paris, 1876, p. 32.

[4] Sur la structure intime de la muqueuse et des glandes uréthrales de l'homme et de la femme. Journ. d'anatomie et de la physiologie, 1874, p. 531.

tention of urine, apparently due to spasmodic stricture, seems to justify the assertions of Robin and Cadiat.

Spasmodic stricture certainly exists. There is more of it than some of the best authorities allow, but far less of it than a few enthusiastic writers would lead one to suppose. The last word has not been spoken upon the subject, and probably will not be until the unfortunate personal feeling, which is at present obvious in all discussions on the subject, shall have passed away.

Who is unfamiliar with the effect of shame, haste, anxiety, anger, nervous excitability, and other emotions, in making it absolutely impossible for a perfectly healthy patient, sometimes, to make water at all for a considerable time? Such retention is due to a spasm of the urethra. The so-called inflammatory stricture is usually only a secondary spasm, induced by the irritated state of the urethra; for the swelling of the urethra alone could hardly successfully oppose the detrusor. The grasping of a sound by an organic stricture, through which the instrument has been passed, is due to spasm. The lack of co-ordination between the detrusor and the cut-off muscles, often leading to retention in cases of locomotor ataxia and partial paraplegia (especially syphilitic), acts apparently by causing spasm of the deep urethral muscles. The different conditions in which deep organic stricture habitually finds itself—sometimes allowing a reasonably free stream of urine to pass, again so nearly closed up that only a few drops can be painfully voided with great effort—this difference is undoubtedly due more to spasm than it is to any purely inflammatory change in the stricture itself. That form of partial or complete retention sometimes seen in connection with a very slight stricture of large calibre, either in the deep or in the pendulous urethra, is certainly due to spasm, as proved by the ease with which many of these cases allow the passage of a large-sized steel instrument without the employment of any force. Of this form of stricture I have seen several instances. Some of the numerous cases reported by Dr. Otis are excellent examples of spasmodic stricture. In some of the cases his diagnosis has been questioned, but most of them are striking examples of the malady in question.

Treatment.—The surgeon's tact and ability are often largely taxed to discover the cause of deep urethral irritability and spasm. To be successful in his treatment he must find the cause; when that is removed the stricture will get well. The cause may lie in a tight meatus, or in an irritable anterior or posterior stricture of large or small calibre; but the spasm is not, by any means, always due to such a cause. I have knowledge of a number of cases in which the urethra has been extensively cut in its forward parts, in accordance with the views of the most modern school in urethral pathology and therapeutics, without the slightest advantage to the patient, although the moral effect of a surgical operation is sometimes sufficient to cause a patient to declare himself better during a long enough time for his case to get into print.

Some deaths have followed the use of the dilating urethrotome. I lost one patient in March, 1873, and showed the diseased kidneys to the Pathological Society during the same month. In this case a deep stricture was divided, and the same result would have followed the use of any other instrument, the kidneys being at fault. Dr. Sands, in one of his controversial papers, reports three fatal cases of urethrotomy, in which the dilating urethrotome was used. Dr. Otis, in his reply in the Hospital Gazette of June 28, 1879, endeavors to relieve the instrument from any *blame in* these cases. But the citation of cases is of no value in this

connection. No one can doubt the mechanical excellence of Dr. Otis's instrument; nor can one doubt that, where any cutting operation will kill, death will follow the cut, no matter by what instrument the cut is made. The reason why the operations made with the dilating urethrotome show such a light mortality is, that these operations are performed almost exclusively upon the pendulous urethra, and urethrotomy in this region is a most trivial matter when compared with the same operation performed upon the deeper portions of the canal. Death very rarely follows urethrotomy in the pendulous urethra. The nearer the meatus, the less the risk; but this fact does not make promiscuous and unnecessary cutting any the more surgical.

The pendulous urethra should be respected when possible, and left as nature made it. That it may generally be cut with little or no risk to life by no means justifies an operation not imperatively demanded by the symptoms in a given case.

I have tested the new method quite extensively, and find myself inclined, by experience, to be more and more conservative, and to cut less and less within the urethra anywhere beyond the first three-quarters of an inch from the meatus—except in desperate cases—believing that such cutting, on the whole, does more harm than good in a majority of instances. This conclusion is a growing one, and has been deliberately reached. It is based not only upon my own cases which I have cut, but also upon a considerable number of patients whom I have cared for on account of the same malady, for which they had been unsuccessfully cut, in some cases a number of times, by the foremost advocates of our day for extensive anterior internal urethrotomy. I do not by any means condemn this operation, which I think an excellent one and indispensable to the cure of some cases; but what I do feel called upon to condemn, is the extensive indiscriminate cutting of the anterior urethra, now commonly indulged in, especially by young surgeons, for any and all possible morbid conditions of the urethra, simply because the canal is smaller in some parts than it is in others, as the Almighty evidently intended that it should be. This will be again referred to at p. 296.

The treatment of spasmodic stricture, then, is to find and remove the cause. If that cause seems to be an organic stricture of the urethra anywhere situated, that stricture must be appropriately dealt with.

The treatment of organic stricture will be discussed after a description of the stricture itself.

STRICTURE OF LARGE CALIBRE.

Stricture of large calibre may be encountered anywhere along the urethra from the meatus up to the apex of the prostate. Stricture of the prostate does not exist. One or two instances of it only have been encountered, or at least recorded. Obstruction, both to the passage of urine and to the introduction of instruments, undoubtedly occurs in the prostate; but such obstruction is due to hypertrophic, congestive, or degenerative causes, involving the prostatic body, and not to any stricture situated in the sinus itself.

The distinction between a stricture of large calibre and one of small calibre is, of course, an arbitrary one. In a general way it may be stated that any stricture, which may be safely treated by dilatation with solid steel conical instruments, is a stricture of large calibre, while one which

may not be so treated must be ranked of small calibre. Such a rule places the boundary between large and small calibration at 10 of the American scale, an instrument five millimetres in diameter (15 French). Below this a conical steel instrument should not, as a rule, be employed in the urethra for dilating purposes.

Stricture of large calibre is frequently congenital at the meatus—that is, the meatus is not developed to the extent to which nature intended that it should be. The meatus is often found sealed up to the size of a pin-head, livid in color, conical in shape, pouting, manifestly unnatural. From this upward it is found of all sizes, sometimes altogether disproportionately large as compared with the rest of the canal.

Now, the meatus should be the smallest place in the urethra, just as the nozzle of any hose-pipe is smaller than the tube itself; and this is necessary for the vigorous delivery of a full, smooth stream. How then shall one decide whether the meatus is too small or not? Simply by ascertaining whether there is any cul-de-sac, any pouch behind either angle of the meatus, on the roof or on the floor of the canal. If a probe passed into the orifice can make such a pouch, then the meatus is too small. This smallness is generally a congenital deformity and not a pathological condition, and its existence never calls for any interference on the part of the surgeon, unless it be presumed to be the probable cause of symptoms, or unless it interferes by its smallness of size with the proper treatment by instruments of morbid conditions of the urethra more deeply seated, or of the bladder. Interference with the meatus for any other cause than these is meddlesome and unsurgical.

The same general line of argument applies to another portion of the urethra—the region lying, in round figures, at about two to three inches from the meatus. Ninety-nine people out of a hundred have stricture of large calibre in this region, if the fact that this portion of the canal is smaller than some portion of the canal anterior to it be looked upon as constituting stricture, as many men of the present day seem prone to believe. All the diagrammatic charts of the urethra which I have ever seen represent the canal as naturally narrowing down in this region to expand again into a sinus before the final narrowing of the meatus. This condition exists normally, and it is as irrational to alter it theoretically, and as Quixotic to attempt to improve upon it practically, as it would be to try to give every one a Roman nose because that type seems the most noble.

These contractions of the urethra at the meatus and lower down, as they are ordinarily encountered, are not pathological. They vary much, as a man's mouth, and nose, and ears vary in size from that of the same organs in another. The contracted meatus is not due to a tight prepuce in early life, or to lack of hygienic care. I have tested a number of Israelites who have had no foreskin since the eighth day of life, and I find these points of contraction as marked in them as in the Christian. Time and again, in examining a patient for one thing or another, not urinary in any sense (cases of chancre, hernia, skin disease, and for morbid conditions of the testicle not inflammatory), I find a very small meatus. I naturally ask for symptoms, but, finding none, I see no occasion to interfere. In examining for stone or enlarged prostate, the second point of narrowing, at two inches or more, may usually be detected; but if it occasions no symptoms, since it certainly does not cause either the stone or the enlarged prostate, there is no occasion to direct any treatment against it.

There is no just measure of size for the urethra, so far as I am aware.

The arbitrary decision that because the penis, in repose, measures three inches in circumference, the circumference of the whole course of the urethra must be thirty millimetres, has a foundation only in the theoretical accuracy of its enthusiastic originator. The circumference of a man's penis in repose varies greatly—after and before a prolonged sea-bath, for instance, and under other circumstances, as I have verified by measurement. The exhaustive paper of Prof. Sands,[1] read before the County Medical Society, and ably seconded by the remarks of Prof. Weir,[2] bringing the literature of the subject up to date, and showing casts of the urethra skilfully executed upon the bodies of four seemingly healthy people of different ages, proved conclusively that there is no uniformity in size to the urethra, and no regularity about it. The casts in Prof. Sands's paper show numbers of constricted points which might be readily demonstrated to be strictures by the urethrameter in a willing hand.

The demonstration of the existence of these bands along the urethra is very easy during life. They may uniformly be found. The larger the exploring instrument, the more bands does it discover. I have not yet found a person upon whom I could not demonstrate points of uneven dilatability along the urethra: whether such person were healthy or the subject of real stricture; whether he suffered from no symptoms or had a gleet; whether his urethra had been cut internally or not; whether the symptoms for which the urethra had been cut had yielded to the treatment or not. I do not know that this experience is universal, but I think it must be. I remember one poor fellow, whose urethra I cut again and again when testing this method, urged on by the patient himself and fortified by the advice and consent of experienced men in consultation. He did not get well, but his urethra finally reached a size which allowed a 27 American (42 French) conical steel sound to pass easily down the urethra into the bladder; and immediately afterward, a No. 39 bulb passed up and down the canal detected a number of inequalities and linear points where the canal was smaller than at other points. One of these bands was situated internally, at a point corresponding to nearly the middle of the frenum externally (for the insertion of the frenum into the glans penis had been utilized in order to enlarge the meatus), and the poor fellow put his index finger into his urethra up to this point, and, asserting that he could feel another stricture there, begged me to cut it. This I respectfully declined to do, and the patient shortly disappeared from view, doubtless to seek other advice.

Therefore I contend that all urethral canals, healthy or unhealthy, will yield bands of irregular constriction to any one exploring with a large enough instrument; and that, too, irrespective of the cure of any stricture which may have been cut, or of the symptom (gleet usually) for which it may have been cut. Consequently, the existence of these bands in the anterior portions of the urethra does not constitute stricture, and stricture may be cured while they still remain behind.

Finally, and most positive evidence of all, I have the anatomical proof that these bands do not constitute stricture. Some years ago I had the good fortune to be present at a post-mortem examination upon the body of a patient who died at a certain short interval—I think it was about two weeks—after perineal section for impermeable stricture, and after having had a number of strictures in his pendulous urethra divided by Dr. Otis,

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[1] New York Medical Journal, March, 1876, p. 225.
[2] Ibid., April, 1876, p. 377.

with his dilating urethrotome. Dr. George Peters had verified the presence of these numerous strictures before the operation; Dr. McBurney made the autopsy. I did not learn clearly of what the patient died, but I believe death was ascribed to the kidney. Dr. Bumstead and myself, in the evening, went to the house of Dr. Otis to examine the patient's urethra. The line of the cut could be seen, but the mucous membrane along the whole course of the cut on either side seemed absolutely sound to the eye and to the finger. No hardness, no bands could be detected. Dr. Otis reserved the specimen for careful examination by the microscope. The result of that examination I have not seen reported.

In one of the cases of death alluded to by Dr. Sands, the floor of the urethra at the autopsy was found divided anteriorly to the extent of three and a half inches; the mucous membrane was not thickened, and "showed no appearance of disease to the naked eye." "A tight organic stricture, undivided, was noticeable at the bulbo-membranous junction."[1] In this case death occurred on the sixteenth day, from uræmia.

At this point it seems desirable to inquire what it is, then, that constitutes stricture of large calibre in the anterior urethra, and when it is necessary for the surgeon to interfere. In answer it may be said: stricture of large calibre of the anterior urethra does exist when an exploring instrument passed gently through a physiologically contracted area draws blood (on account of an erosion or a granular condition of the membrane at this point), or when the physiological condition is carried to an excess, as, for instance, when the meatus is only as large as a knitting-needle. How small the second or other contracted points of the urethra must be to constitute stricture, I do not know; and I consider it as unimportant as I do the size of the rectum at one of its natural points of constriction—the sphincter tertius, the point of reflection of the peritoneum. Stricture may also certainly be said to exist when it may be felt as a fibrous band from the outside, after a full dilating solid instrument has been passed through it. None of the physiological bands can be so felt, while the inodular deposits can always be felt.

Finally comes the really practical question: When should a surgeon interfere with instruments in the treatment of stricture of large calibre of the anterior urethra? The proper answer I believe to be, never until the occurrence of symptoms calls for interference. This rule, like all others, has its exceptions. I believe, however, that it holds absolutely for all congenital strictures of the meatus, unless they are very tight, and for some strictures in this region the result of cicatrices. It holds also for that (we may call it) physiological band of constriction often found just within the meatus, at about one-fourth of an inch or thereabouts, and certainly for the deeper bands in the pendulous urethra. It is exceedingly rare for any stricture of large calibre of the anterior urethra to close so tightly as to give rise to serious urinary complications (leaving spasmodic stricture from reflex action out of the question), except the variety known as inodular stricture, and stricture resulting from a cicatrix of the meatus. Both of these forms of stricture, then, may be appropriately attacked before they have given rise to any symptoms—stricture of the meatus, and inodular stricture of the pendulous urethra—such a stricture as may be felt like a ferule, or a lumpy band around a solid instrument which has been introduced through it.

Symptoms of stricture of large calibre.—These strictures may

[1] L. c., p. 135.

give rise to spasmodic and irritable troubles in the deep urethra, symptoms of cystitis, sciatica, and of the most varied nervous functional troubles in different parts of the body. When they do so act, however, they are themselves generally more or less sensitive, sometimes inflamed and granulating upon their surface. Sometimes, on the other hand, especially at the meatus, such strictures are neither inflamed nor sensitive, and it often becomes a very nice question to decide whether they have anything to do with troubles deeper in the canal or not.

The vast majority of these strictures, according to my experience, produce no symptoms whatsoever, excepting a slight gleet, and very many of them not even that. Before deciding that a given tight spot in the urethra is the cause of other trouble deeper in the canal, it is wise to eliminate all other sources of such trouble, and not to jump at the conclusion that because there are bands in the urethra, and spasmodic or inflammatory trouble farther down, the latter necessarily depends upon the former, and will be relieved by a cutting operation. Such a doctrine must certainly sooner or later lead a young man to the border-line of quackery, if not into its domain.

In cases of grave doubt the surgeon is certainly justified in operating upon strictures with the knife, and if no good comes of it he cannot be blamed; but he should only decide to act after due deliberation and a careful study of his case. The meatus and first inch of the canal may be cut with far more impunity, and to a greater extent, if necessary, than any other portion of the canal.

The most common symptom of strictures of large calibre in the pendulous, or in the deep urethra, is a gleet, more or less purulent.

Diagnosis.—When a stricture of large calibre is important enough to yield any symptom besides the possible (but improbable) spasmodic and reflex irritative phenomena referred to and the gleet, there are certain physical means of diagnosis which yield quite accurate results. One quite constant symptom, really analogous to gleet, is the occurrence of little thread-like bodies, snaky rolls of white material which float around in the freshly voided urine, gradually sinking to the bottom of the vessel. These are clusters of pus-corpuscles which have gathered upon the excoriated and granular surface of the urethra at and behind the stricture, like soft scabs, and are washed off by the stream of urine in its passage. They can be easily caught in a pipette and examined with the microscope. These shreds of pus-cells are not pathognomonic, since they occasionally come from the prostatic urethra; but they seldom do so, and generally indicate stricture of the urethra.

Fig. 30.

The clinical diagnosis of stricture of large calibre is easy and satisfactory. A bulbous bougie (Fig. 30), preferably of metal, as large as the meatus will take, may be warmed and anointed with vaseline, and gently passed through the urethra. When it comes to a tight spot the surgeon can feel it as well as the patient. If this spot is the seat of the gleety discharge, the bulb of the instrument is very apt to be faintly tinged with blood at its tip upon withdrawal. Points of stricture are often sensitive; their length may be measured by the aid of this bulbous instrument and their number ascertained, if more than one exist. This exploration refers only to the pendulous urethra.

If, on attempting this exploration, congenital or pathological narrowing of the orifice of the urethra be found to exist, the canal may still be

explored without cutting the meatus, by the use of the very ingenious expanding urethrameter (Fig. 31) devised by Dr. Otis. This instrument A is introduced closed B, capped with a piece of thin rubber C, down to the sinus of the bulb. It is there to be expanded until the patient feels a slight distention, and then to be slowly withdrawn toward the meatus. Upon encountering resistance the handle is turned so as to make the size of the bulb smaller, all changes in the bulb being marked upon an index-plate at the handle. The shaft of the instrument is marked in inches, and by its aid all constrictions in the canal may be accurately located, measured, and calibrated.

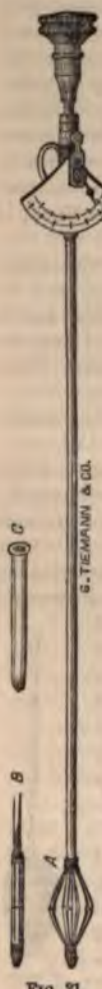

FIG. 31.

In short, exploration by this instrument leaves nothing to desire, excepting a point of departure. Here, unfortunately, it fails, for it has to assume either that the size of some portion of the canal is the natural size of the whole course of the urethra (which is manifestly inaccurate, as has been shown), or the surgeon has to assume some arbitary dimension as being the proper size of the urethral canal, and in this he is as apt to be wrong as to be right, the danger being that he will overestimate the size of the canal, because he starts in one of its widest natural pouches.

Moreover, with this instrument, damage is apt to be inflicted upon a sensitive urethra, which may and often does lead (as I have witnessed) to an aggravation of all the symptoms for which the exploration was made, and to the lighting up of new ones (cystitis, epididymitis). This instrument dose excellent service at times, mainly in the way of accurately locating strictures in the pendulous urethra, which the surgeon has decided should be cut.

When, therefore, the meatus is small and the urethra has to be explored, the stricture of the meatus, and any tight spot within the first three-quarters of an inch from the meatus, may be cut at once as a part of the examination. If the meatus alone is involved, it may be cut down to the bottom of any pouch lying behind either of its angles, and fully two sizes (American scale) larger, for in healing it will contract somewhat, and it should be left so that when well it may be at least physiologically large. Any band smaller than the new cut meatus and lying near it should also be cut at the same sitting, as part of the examination.

This course is advised for several reasons. First, the urethra cannot be properly explored from before backward with a bulbous bougie, unless the orifice of the urethra will admit the passage of a fair-sized bulb.

Secondly, no organic stricture deeper-seated can be treated with sufficiently large instruments unless the meatus is prepared for their reception.

Thirdly, no treatment will cure a stricture at or near the meatus, except the knife, so far as I know.

Fourthly, the operation itself is trivial in importance, pains but little, never calls for the use of an anesthetic, and never, in my experience, when performed upon an urethra which would tolerate any interference whatever or was fit for any examination, has given rise to any complication or subsequent discomfort. When practised alone I never have seen it *cause urethral* chill, or irritation of the canal, or epididymitis, or cystitis.

The simultaneous use of the sound upon the deep urethra, however, may cause any of these complications.

The meatus then should be cut a little larger than full size, and the bulb, then introduced as through a natural meatus, will detect strictures in the pendulous uretha, if there be any.

Stricture of large calibre of the deep urethra may be sought for with a blunt (not a conical), well-warmed steel sound of a size as large as the anterior urethra will admit. If there be spasmodic stricture of the deep urethra, such an instrument, in my experience, will always go in if properly handled. It is written on good authority that this will not always occur, and I must therefore believe it; but personally, after considerable experience I can say that I have never met a case which I believed to be spasmodic stricture in which I could not pass a blunt sound in the way I shall describe, and certainly I have never cut a case of spasmodic stricture by the perineal section; for, in all my cases of this operation—some done with and some without a guide—I have invariably been able to see and to feel the morbid tissue constituting the stricture in the bottom of the perineal wound.

I believe also that a spasmodic stricture of the urethra must necessarily yield under ether and allow the passage of a full-sized blunt sound, notwithstanding a recent case reported to the contrary by Dr. Otis.

The blunt sound, well warmed and oiled, should be gently carried down the urethra and its beak presented accurately at the hole in the triangular ligament. Here it should be held under even pressure—rather firm, but not violent—a perfectly uniform pressure and with a very steady hand, for several minutes, perhaps five, or possibly more. The patient, meantime, should be entertained and diverted, pleasantly if possible—the scrotum being held well up by the unemployed hand, which at the same time steadies the beak and the curve of the instrument through the perineum. If under such a manœuvre the sound does not presently slip along and glide smoothly and rather swiftly into the bladder, it is, I believe, always either because the stricture is not spasmodic, or because the beak of the instrument has not been properly brought to bear upon the cramped muscles.

Treatment.—Stricture far forward in the urethra must be cut to be cured. This is most conveniently done with a straight, blunt bistoury. The prepuce should be retracted, the previously dried head of the penis seized between the thumb and index finger of the left hand, and the blade of the knife, well oiled, introduced to the proper depth in the urethra. It is generally best—often necessary on account of the pocket—to cut the meatus along the floor of the urethra; but in some peculiar shapes of the glans penis it may be better to cut the roof of the urethra.

When all is ready the surgeon squeezes the glans penis tightly with the thumb and finger which hold it, since this diminishes the patient's perception of the pain of the cut, and at the same moment slowly and steadily draws the well-oiled sharp blade along the floor of the urethra, appreciating with his surgical sense of touch the resistance offered to the knife by the encircling band of stricture. When this yields and is thoroughly cut through, he can appreciate it at once by a cessation of the feeling of resistance which the band has given, and he has cut enough. If it is only a pouched meatus which the surgeon has to transform into a slit, he regulates his incision accordingly. Civiale's or any other meatotome may be used, if the surgeon prefers. Dr. Otis advises the operator to place the index finger of his left hand along the integument beneath the urethra, so that the stricture band may be felt between the finger and the knife. In this position he cuts directly upon the finger until he can feel

the point of the knife against the soft tissues and appreciate the absence of the band between the finger and the knife. This is an excellent method—better in many cases than any other.

The cut meatus sometimes bleeds profusely, sometimes hardly at all. The expedients for stopping blood are: pressure for a time, followed by collodion applied in several coats to the well-dried meatus while it is held together under pressure, to keep the blood from oozing while the collodion is drying on; or a small roll of absorbent cotton soaked in pure subsulphate of iron, which may be introduced into the bottom of the cut with a probe. There is never any danger from possible excess of bleeding, for the patient can always stop the hæmorrhage until the surgeon arrives, by digital pressure, and the surgeon can always finally arrest it by injecting the urethra with the liquid subsulphate of iron diluted about one-half. It is better not to put subsulphate of iron into the urethra, if it can be avoided, since this substance is apt to leave the walls of the canal inflamed, hardened, and ready to suppurate. Much time in the treatment may be lost on account of the use of this hæmostatic.

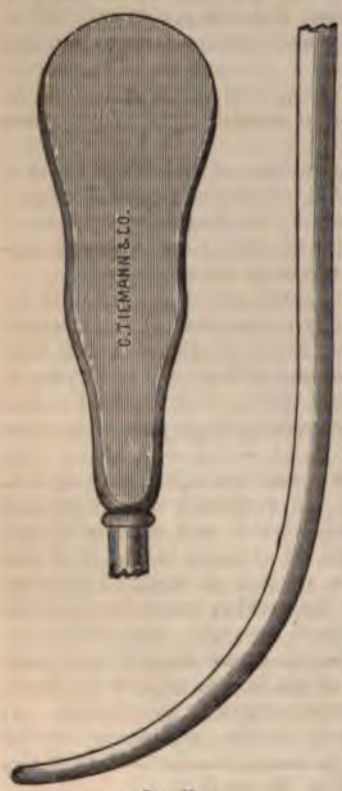

Fig. 32.

When there is little or no bleeding, some cotton or lint, so arranged as to be retained beneath the prepuce, is all that is required.

A cut orifice will heal up immediately if left to itself. My usual plan to prevent this is to furnish the patient with a hairpin, with the curved portion rebent and the angle much increased in size, so as to be large enough when oiled, and passed down the urethra, to lie with one leg of the pin against the roof of the urethra, the other leg at the bottom of the whole length of the wound, while the two points are outside. I tell the patient to pass this on the night after being cut, and on the following two nights; then to skip a night for two passages; then to skip two nights for three passages of the pin. By the end of this time (a full fortnight) the meatus has often healed entirely, or so nearly that it may be left to itself, and, if thoroughly cut and healed open, it never recontracts.

The treatment most appropriate for all other organic strictures of large as well as small calibre, is by dilatation at first. Should this fail, other means are at hand. Steel instruments, nickelled, conical in shape, are most serviceable, and do the most accurate as well as the most effective work in dilating the canal, either pendulous or deep, provided the size of the instrument is as large as No. 10 American (15 French). Should the stricture be smaller than this size, soft instruments are best to commence with.

The conical instrument (Fig. 32) tapers for two and three-quarter

inches, and should be made upon what is called the short curve, with an extra shortness of the curve at the last half-inch near the beak, since this extra curve greatly facilitates introduction, especially at the hole in the triangular ligament, by keeping the point of the instrument against the roof of the canal. Such an instrument, as large as the stricture will admit, well oiled and warmed, should be passed with great gentleness well into the bladder. The power of the instrument is great, being, as it is, a compound of wedge and lever, and the surgeon should exercise considerable self-control, so as not to abuse that power. The passage of one such instrument as this is equivalent to the passage of seven sounds of the old blunt pattern, since the conicity in the larger instruments extends through seven sizes.

The instrument is to be introduced, and then, very gently, immediately withdrawn. At the first sitting only one sound should be passed—a sound of moderate size.

The time most appropriate for a reintroduction of the steel sound in a case of stricture of large calibre must be determined by the effect produced by the instrument upon its trial trip. The immediate effect is often only an increase in the amount of pain experienced during urination. After a day or two the discharge from the urethra often visibly increases; but this subsides spontaneously, or by the aid of a very mild injection, and at the end of four or five days the symptoms for which the sound was introduced have reached the same grade as that at which they existed at the moment of the first introduction of the sound. Twenty-four hours should now be allowed to pass, or even forty-eight, and then a sound of one or two sizes larger may be gently passed into the urethra.

The result of this second instrumentation is that the symptoms are less aggravated by it than they were by the first, improvement arrives a little sooner, is more marked, and remains longer. In this way, increasing the sizes, and using on each occasion a conical sound as large as will pass, the symptoms generally yield entirely, and the patient is well. The most effective treatment by large instruments is that which leaves an interval of one week between the passages of the sound.

After the symptoms have disappeared the treatment should be discontinued gradually. In some mild cases of stricture, not resilient and not traumatic, treatment may be suspended entirely after a few weeks, and the patient is and remains well for the rest of his life, excepting that he is capable of getting a new gleet from a lighter cause than if he had never had stricture. If he does not expose himself, however, to the causes of urethritis, he may marry and remain well for the rest of his days, in most instances, without ever showing any symptoms of lack of health in his urinary or genital apparatus. This is especially true concerning strictures of large calibre of the pendulous urethra, those for which such splendid results in the way of radical cure are claimed by the advocates of the perpetual use of the knife. Truly, in these cases cured by dilatation, the urethrameter, if screwed up to make the bulb large enough, will detect tight places along the pendulous urethra after cure; but so it would have done when the patient was virgin of all disease, and I have already shown that tight places in the pendulous urethra, without symptoms, cannot be regarded as strictures at all.

RESILIENT STRICTURES OF LARGE CALIBRE.

There is a class of strictures in the pendulous urethra which produce varied symptoms—generally gleet—and which do not yield entirely to dilatation, nor do their symptoms disappear under the use of the steel sound.

These cases belong to one of two groups: either (1) the patient's general health is such that local means will not (alone) cure him, as is known to be so often the case in catarrhal affections of other mucous membranes attended by thickening; or (2) the stricture is resilient and does not yield to dilatation.

Regarding the first class, the patient's general condition must be studied, and especially his sexual hygiene. I have known many a case to get well and to stay well, without there being any necessity for a continuation of the use of instruments in the urethra, and this cure has been effected simply by marriage, after all other means, including extreme dilatation and extreme cutting, had failed.

I have known others to get well promptly by a sea-voyage, change of climate, a prolonged trip to the country, when extreme cutting, by the best-known advocates of this plan, has failed to give relief.

Then there are cases of gleet associated with tubercle, with prostatic disease, with chronic inflammatory trouble in the seminal vesicles, in which it is folly to attempt a cure, either by dilatation or by cutting any or all of the bands and tight places in the pendulous urethra which the urethrameter or bulbous sound can be made so easily to detect.

But, finally, the second group of strictures of large calibre remains. They are resilient, that is, they have in them that tenacious, cicatricial, retractile quality which does not allow dilatation to affect them favorably beyond a certain point. The symptoms yield, but do not entirely disappear. A little gleet in the morning continues to mock the efforts of the surgeon and to disgust the patient with his disease, and often with the science of medicine. In these cases, after being certain to locate the symptoms accurately in the stricture, and not to be deceived by ascribing gleet due to diathetic or other cause to a tight spot found in the urethra, the surgeon may employ internal urethrotomy within the pendulous urethra. Under these circumstances, the operation offers a good chance of success in ridding the patient both of the final remains of his symptoms and of the necessity for a continuation in the use of sounds—if the surgeon cuts wide enough at any one point and passes entirely through the unyielding contractile ring of stricture. This ring of inodular tissue is white, fibrous-like, cicatricial tissue, and not the yellow elastic fibres which Robin and Cadiat have found so abundantly in the structure of the healthy urethral mucous membrane.

The treatment by internal urethrotomy, however, is only generally applicable to the pendulous urethra. All organic strictures at or deeper than the bulbo-membranous junction should be treated by dilatation alone—by dilatation to the greatest limit to which it can be carried with gentleness, and this will cure the symptoms, or so nearly cure them that most sensible men who are made familiar with the dangers of internal urethrotomy in the curved portion of the urethra will be satisfied with the result.

Such a cure, or relative cure of stricture in the deep urethra, especially in bad cases of inodular stricture, cannot be maintained excepting at the expense of constant dilatation. The patient is condemned to pass *an instrument*, at such intervals as may be found necessary (from once a

week to once a month, after a time at longer intervals), for the remainder of his life, in order to keep down his symptoms and to prevent the recontraction of his stricture. And this is still the case, no matter by what treatment the urethra has been brought to such a size as to allow the passage of a full-sized instrument into the bladder. Repeatedly does the surgeon find, in hospital and dispensary practice, cases of tight stricture in the curved urethra, which have already been subjected once, twice, or perhaps three times to internal urethrotomy, or even to external urethrotomy. I have performed perineal section more than once under each of these circumstances, where the patients, from neglect to pass the sound continuously after a former cutting, had allowed the urethra to close at the point of stricture. And I have treated a large number by dilatation, after recontraction had followed the cutting operation.

Stricture of large calibre in the pendulous urethra may be cured by a variety of means, so that its symptoms may cease forever, without the necessity for any further use of instruments in the canal.

The same is true regarding the treatment of a mild stricture of the deep urethra cured by dilatation.

Resilient stricture of large calibre in the *pendulous urethra* is often incurable except by the knife; and internal urethrotomy, if the cut be large enough, will generally cure the symptoms of such a stricture so that they will not return, although no instruments are used in the urethra after the cut is well.

Small organic strictures in the pendulous urethra are probably always best managed by internal urethrotomy.

Strictures of the deep urethra, when organic and situated at or beyond the bulbo-membranous junction, cannot, all of them, with certainty be radically cured by any operation or by any treatment with which I am familiar. The best treatment in these cases is always dilatation when practicable. Sometimes, after dilatation has been maintained for a long period, the tendency to recontraction ceases, and the patient remains well, so far as symptoms are concerned, without the necessity of any further instrumentation in the urethra. Possibly a like cure may occasionally follow internal urethrotomy—I have known it to follow external urethrotomy in one case; but, in the majority of instances of inodular, organic and traumatic strictures of the deep urethra, a cure is not obtained radically by any operation yet known, and the patient's safety consists in a maintenance of the calibre of his urethra by the occasional passage of a full-sized instrument through the obstruction for the rest of his life—a task not considered at all difficult by those who do it.

INTERNAL URETHROTOMY IN THE PENDULOUS URETHRA.

If, then, internal urethrotomy has become necessary in the treatment of a stricture of large calibre of the pendulous urethra, which of the numerous instruments for performing the operation shall be used, and to what limit in size shall the urethra be cut?

I have tried nearly all the improved modern urethrotomes, and have found none so good as the dilating urethrotome of Dr. Otis, for dealing with such strictures as have to be cut in the pendulous urethra; and I must repeat that, in my opinion, deeper-seated strictures of large calibre should not be cut internally, for the double reason that: 1. Cutting in this region is a proceeding dangerous to life; and, 2. Cutting in this region

does not produce a radical cure, nor allow the patient to dispense with a continual use of the sound to keep his stricture open; or it does this so seldom that its curative action cannot be relied upon, and the hope of cure does not justify the risk incurred by external cutting.

Otis's instrument is quite simple and strong. It is a happy modification of a number of previous types, so combined as to form an instrument which performs its functions very accurately. It consists (Fig. 33) of a shaft, the blades of which may be separated by a screw-movement in the handle, and a small knife concealed near the distal end of one of the blades, which is drawn up upon a concealed bridge, and brought into action when its handle at the proximal end of the instrument is pulled upon. A dial-plate in the handle registers the degree of separation of the blades.

Fig. 33.

To use this instrument, with the urethrameter or bulbous sound, the location and extent of the stricture to be cut are at first definitely decided upon. Then the urethrotome is introduced (dial-plate and knife uppermost, as a rule) so deeply that the point at which the knife-blade shall emerge shall be at least three-quarters of an inch deeper in the urethra than the deepest limit of the stricture. This I find necessary in all strictures of large calibre; without it the deepest parts of the stricture—those most distant from the meatus—are not cut. For I find that the lower blade of the instrument, in opening, pushes away the urethra, making it slide back from the upper blade; so that, no matter how accurately the meatus may be held against the shaft of the urethrotome, the position of the knife relatively to the stricture slides forward proportionately to the amount of separation of the blades, and therefore, when the knife is brought into action, it may commence the cut entirely in front of the deepest (often the tightest) portion of the stricture, unless special care be taken to avoid this mishap.

When the instrument has been properly placed, the blades are separated until they mark the size to which it is desired to cut the stricture. In cutting, the handle of the knife is withdrawn far enough to make the cut in all at least half an inch longer than it was originally decided that the stricture measured. Now the blades are to be rapidly approximated, and the knife returned to its concealment before withdrawing the instrument. If other strictures exist farther forward, they may all be included in a single incision along the roof. If a considerable interval of healthy urethra separates them, they may be cut at the same sitting, but by different operations, the deeper one being cut first. The flow of blood forms no material impediment to cutting the second stricture. If the meatus is to be cut, it may be included in the first incision along the roof, or, perhaps better, cut along the floor as the first step in the operation, if this has not already been attended to in the preliminary examination as directed at page 301. No ether is necessary in the performance of this operation. It should be done slowly, for accuracy and precision are essential factors of success. Stretching the tissues during the separation

of the blades generally hurts more than the final cut, according to the assertion of most patients.

After the cutting has been accomplished, it is well to pass a bulbous sound over the cut region, to decide whether the cutting has been efficient and has thoroughly relieved the constriction.

If this is found not to be the case, the urethrotome should not be reintroduced. The second cut is likely to pass through the stricture at a different point, and a third cut to take still another route, as has been proved post-mortem (Sands, l. c., p. 135). Thus the stricture becomes partly cut in a number of places, its outmost circle not being cut through anywhere; and more cutting is done than is justified by the end in view, since each cut increases the possibility of pyæmic complications. The way to avoid the necessity for a second cut is to make the first one deliberately, to locate it accurately, and to make it deep enough. If this is not done, I believe it to be wiser to postpone the second operation two or three weeks until the first cut has healed, and then to start afresh, as if nothing had previously been done.

It remains to determine how deeply to cut a given stricture of large calibre in the pendulous urethra. This cannot be absolutely decided by any criterion with which I am familiar. Dr. Otis has fortified his followers with a scale very pleasing in its apparent accuracy, based upon an alleged constancy of relation between the normal size of the urethra and that of the penis in repose; yet this accurate scale (which is certainly only approximate) does not give its followers the satisfaction of doing the whole operation at a single cut. In all the operations which I have seen performed by surgeons, and in most of those recorded in medical journals, the urethrotome is introduced twice or more often at the same sitting; and very frequently it is found, after some days or weeks, that recontraction has occurred, and the stricture has to be cut over again. I have personal knowledge of repetitions in the cutting, to the extent of four times at different sittings, having been done on one and the same individual, by a surgeon than whom none can be more competent in this operation, and that too without resulting in a cure. Consequently it is rather idle to attempt accuracy by measuring so uncertain an organ as the penis, even if the scale possessed the accuracy which its inventor ascribes to it; and the question remains: What rule, if any, have we to go by?

In answer, it may be stated as a general proposition, that the strictured point which will not yield to dilatation must be cut so as to be considerably larger than the normal urethra at that point; and that, to insure the best results, a single cut should be made—a cut, if possible, to pass beyond all diseased tissues and into the healthy tissue.

This result is probably often attained by following the measurements of Dr. Otis, since his estimation of the size of the urethra is extreme; but even his measurements will not suffice in some cases where inodular tissue has involved the whole substance of the corpus spongiosum, while often they are unnecessarily high.

The best guide with which I am familiar is the natural size of the healthy meatus—a meatus which has no pockets above or below, or out of which such pockets have been cut with the bistoury, so that the meatus may be a flat slit, and not a round point at the apex of a conical glans penis. Furthermore, it must be remembered that the strictured area is not simply to be restored to the normal calibre of the urethra at that point when it was a healthy, elastic canal; but it must be cut considerably beyond this size, both to insure against the certain amount of contraction

which necessarily takes place at the angle of the cut as it heals, and the more certainly to cut through the outer circle of fibres at the constricted point.

A fair rule to go by is first to establish the fullest size to which the normal meatus may be distended—the normal meatus not strictured and without pockets—and to cut the stricture, after having screwed up the urethrotome to mark not less than two sizes (American, three or four sizes French) higher than that limit. Should the meatus be strictured congenitally or by disease, the surgeon's judgment must guide him in the extent of his incision, both of the meatus and of the deeper-seated stricture, remembering that the normal meatus of the full average-sized penis in the American will range very close upon 20 American scale (30 French). In other words, a conical steel instrument of size 20 will pass, by its own weight, the normal meatus (without pockets) in the average American male taken at random, with fair-sized genitals, or certainly may be passed with a little coaxing, putting the meatus more or less on the stretch, without in the least tearing or injuring it. A penis of less size will have a more moderate urethra, as a rule.

It has been found by experience, as Dr. Otis has shown, that the breadth of the knife-blade does not count, and that if the blades of the urethrotome be separated to 20 and the cut then made, the strictured point will be found to be cut not above size 20. Therefore, the limits of cutting which I have given are quite moderate, for the meatus is normally the smallest part of the canal, and an incision at least two sizes larger, lower down, is not extravagant, since the cut is quite certain to lose one size while healing.

If, after healing, it is found that the symptoms persist, and the resiliency of the stricture remaining shows that the outside fibres have not been cut through, then another operation may be performed, the surgeon being fortified by the knowledge gained during the first operation, and the cut on the second occasion may be made two, or even three (American) sizes larger than before.

I believe that two operations are safer for the patient than one performed at random or extreme on the start. If it must be extreme—and possibly some exceptional cases require it—the extremity should be proportioned to the necessity, and should not be a matter of routine. If after the first cutting the symptoms disappear, no further cutting is justifiable, even although the urethrameter or bulbous sound should detect that the point cut is still smaller than the urethra in front of it and behind it. The occasion for interference with stricture of large calibre in the pendulous urethra is not its existence, but the symptoms it produces. *If there be no symptoms, tight spots in the pendulous urethra of large calibre may be safely disregarded.*

The bleeding after internal urethrotomy is very variable. A deep incision in one patient may be attended by a moderate flow of blood, while a slight cut in another will bring on profuse hæmorrhage. In a given patient, however, the amount of hæmorrhage is proportionate to the number and depth of the cuts. Generally, pressure will arrest the bleeding. It is best applied with the fingers placed directly over the urethra. The blood should be allowed to clot, and the clot that forms and protrudes from the meatus should be left in place and not be removed with the fingers, for this only allows a continuance of the hæmorrhage and necessitates the formation of another clot. If the flow of blood persists, continuous pressure from without may be tried by placing a piece of split lead-

pencil along the urethra, with its convexity toward the skin, and securing it in place with adhesive strips and a narrow bandage; or, what is better, if at hand, the instrument especially designed for the purpose by Bates, of Brooklyn, may be employed. It is constructed on the same principle as Trendelenburg's tracheotomy tube and Guyon's lithotomy tampon. This instrument is simply a thin rubber tube encircling a catheter, and so arranged that the outer rubber may be inflated with air or iced water after the instrument has been secured in place so as to pass lower than the cut point (Fig. 34). The outer tube has two terminal outlets, *b* and

FIG. 34.

c, so that a continuous stream of iced water may be kept passing through it, if desired, while the urine may be drawn through the catheter by taking out the plug, *a*.

Another excellent means of arresting hæmorrhage is by injecting the urethra full of the liquid subsulphate of iron. The fluid is to be rapidly thrown into the urethra, a drachm is usually enough, and held there by a thumb and finger at the meatus for about half a minute. On liberating the meatus a discolored watery fluid escapes, but no red blood if the injection has been effective, for the urethra is effectually plugged with a solid black clot, generally quite hard enough and adherent enough to stop all hæmorrhage. The only objection to this process is that it tends to induce suppuration, and sometimes active inflammation of the urethra—perhaps of the whole circumference of the canal,—and in this way to interfere with the subsequent use of instruments of sufficient size to maintain the cut open until it has healed to the bottom.

Sometimes little or no blood escapes at the moment of operation, but later, at the time of the next urination or during erection at night, hæmorrhage comes on which sometimes becomes profuse. The same means will arrest it as those alluded to above.

The after-treatment consists in the use of the conical steel sound at appropriate intervals. Twenty-four hours after the cutting, a full-sized sound—large enough to put the meatus fully upon the stretch—may be gently introduced. This is followed by hæmorrhage, sometimes more profuse and harder to arrest than that which occurred at the moment of the operation; but it yields more promptly, as a rule, and generally becomes arrested spontaneously after a few moments. After another interval of forty-eight hours, the same full-sized sound may be introduced; or, if the urethra be generally inflamed so that the size causes much pain, one size lower may be employed, but nothing smaller. Again, in forty-eight hours, the process is repeated. The next interval may be three days, and the next four. After this, one or two passages of the sound, at intervals of five days, often terminate the case, although in many instances a much longer time is necessary, and sometimes one, two, or even more sizes in the sound are lost, owing to inflammatory conditions in the urethra excited by the mechanical violence to which it has been subjected. The cut is known to be healed when a full-sized instrument may be passed without being

followed by any blood; but even after this it is wise to keep up the use of a full-sized sound, at longer intervals, for a time.

If now the symptoms have disappeared, the sound may be laid aside, and the patient is and remains well, although manipulation with the urethrameter may still detect that the point cut is smaller than other parts of the urethra. If the symptoms persist and the stricture recontracts, it may be cut again as before, but to a greater extent, as already described above.

These remarks, I must again repeat, apply to strictures in the pendulous urethra.

The complications attending this operation besides hæmorrhage, which can always be arrested in the pendulous urethra, are those inherent to most operations upon the canal, and due often as much to the after-treatment by instruments as to the cutting operation. They are urethral fever from shock, epididymitis, cystitis, possibly prostatic or peri-urethral abscess, sometimes yielding fistula, occasionally pyæmia and surgical kidney. Another complication, not very uncommon where the cut has been deep, is the formation of new inodular tissue in the corpus spongiosum, causing painful erection and chordee. Some writers have reported that the latter condition may remain more than a year; painful erections often persist for many months.

All these complications call for treatment when they arise, and many of them demand a cessation in the employment of instruments to keep the cut open. Thus, the latter is allowed to close, and much of the good which might have been attained by the operation is lost. One of the best means of avoiding complications after urethrotomy is to keep the patient quiet upon his back for several days after he has been cut, giving him plenty of bland diluents to drink, and enough bromide or opium, if need be, to keep down erections. The ingenious device of surrounding the penis with a coil of rubber-tubing, through which iced water is made to flow continuously, has proved, in my hands, rather a source of erections than a restraint upon them. Injections are not desirable in the after-treatment of urethrotomy, and the balsams are useless. Laxatives are of service while the patient is in bed.

CHAPTER V.

STRICTURE OF SMALL CALIBRE.

Symptoms of Tight Organic Stricture; Diagnosis.—Expedients for Threading fine Strictures.—Treatment of Stricture of Small Calibre.—Continuous Dilatation.—Internal Urethrotomy of the Deep Urethra.—Divulsion.—Perineal Section; with a Guide; without a Guide.—Urethral Fever and its Treatment.

ORGANIC stricture of small calibre of any size, from 10, American scale, down to a constriction through which nothing can be passed, is the most important malady of the urethra with which the surgeon has to contend. Its causes are gonorrhœa and mechanical or (rarely) chemical violence; its origin may be congenital; at the meatus, the cicatrization of ulcers is a not infrequent cause.

The seat of election of this stricture, as shown by all the statistics with which I am familiar—which have been collected in the dead-house, as well as by the daily experience of the great majority of capable clinical observers—is in the deep urethra, at the bulbo-membranous junction or thereabouts, when due to gonorrhœa; a little farther back, even well in the membranous urethra, after such common traumatisms as bruising injuries of the crotch. It may be found also congenitally, or as a result of a cicatrix at the meatus, or anywhere along the pendulous urethra, due to injury or to gonorrhœa, when there has been much chordee, especially if the chordee has been broken. In the latter case, the stricture is due to the mechanical rupture of the stiffened and inflamed corpus spongiosum more than to the gonorrhœa pure and simple. Much that has been said in the last chapter, in a general way, concerning stricture of large calibre, applies equally well here; but some especial points in regard to tight organic strictures call for a separate description.

SYMPTOMS OF TIGHT ORGANIC STRICTURE.

The most common symptom of tight organic stricture is a diminution in the size of the stream of urine. The flow may be projected in full force, and the stream be as smooth as possible, perhaps bright and clear; but it is a mechanical impossibility that it should be large. The patient may assert, as he often does, that he never in his life passed a larger stream, but such assertions are of no value. Generally the stream is not smooth, but flattened, or variously distorted. One stream may flow away with some force, while another, starting below it without force, dribbles to the ground, or takes a different direction, or perhaps twists itself partly around the other. Again, when the stricture is quite tight, the flow is apt to commence painfully in drops, and only to reach the proportions of a continuous stream after the lapse of some time, and after considerable effort on the part of the patient. From catching cold, or by

the effect of local spasm from other cause, the constricted point may become actually occluded, so that retention comes on. After this has been relieved in one way or another, the patient again urinates with more or less facility, until he is overtaken by another retention, by cystitis, or by some other symptom, which leads him to seek advice.

The next symptom in frequency is gleet. Gleet, more or less purulent, is found in nearly all cases of tight stricture, but its presence is not necessary. I have known a stricture, traumatic in origin, almost impassable to a whalebone bougie, and yet existing for years without the least show of gleet.

Irritability of the bladder is a very common symptom caused by tight stricture. The cystitis, which comes on gradually, is mainly confined to the neck of the bladder; it is very mild in character at first, but goes on increasing, so that in many cases of old tight stricture the bladder symptoms alone are those for which the patient consults a surgeon, and for which he demands relief, perhaps by medicine, ignoring the cause in the urethra. The urine, in these cases, is more or less charged with pus. Partial relapsing chronic epididymitis is another symptom of stricture far from uncommon, and to these may be added perineal fistula following abscess, infiltration of urine, and a long list of reflex phenomena, already alluded to in the chapter on stricture of large calibre; urethral neuralgia, sciatica, pains, paralysis, spasm, etc., and certain remote symptoms such as hydrocele, stone in the bladder, sterility, etc. Finally, the natural ultimate result of tight stricture is general chronic inflammation of the bladder, attended by thickening of the walls of the viscus, sometimes concentric hypertrophy (thickening of the walls, with permanent diminution of the cavity), dilatation of the ureters, pyelitis, interstitial parenchymatous nephritis, uræmia, and death. Many a death ascribed to Bright's disease is in reality due to kidney changes, brought on by long-standing tight stricture of the deep urethra.

DIAGNOSIS OF STRICTURE OF SMALL CALIBRE.

Tight stricture at the meatus may be seen. Along the pendulous urethra it may often be felt from the outside, being usually more or less inodular, composed of a new deposit of fibroid material similar to the tissue of the cicatrix after a burn. An accurate diagnosis, however, may be made from within the urethra by the use of instruments for exploring the canal.

Nothing more need be added to what has already been said in the last chapter concerning the possibility of confounding spasm of the deep urethra with true organic spasm. If the precaution be taken to commence an urethral examination with a large-sized blunt (not conical) steel instrument thoroughly warmed, and to proceed as directed in the section on the diagnosis of spasmodic stricture, I think that an error will become practically impossible. In any doubtful case it is wise to bring the meatus up to its full normal size, as laid down in the last chapter, before commencing the exploration, or it may not be possible to use a large enough blunt steel instrument to decide the question positively.

Commencing, then, with a large blunt instrument, and working down to smaller sizes, it will sometimes turn out that the tight organic stricture does not exist at all. A surgeon may declare that no instrument will pass because he has used a fine whalebone to commence with, and, having caught

this in some follicle, has been unable to reach the bladder; or, he may have passed a small instrument into the bladder, and, finding this held somewhat by the urethra on its way out, he decides that there is tight organic stricture.

It has happened to me in my clinique, at Bellevue Hospital, to have a patient brought in under these circumstances—a patient whom I had not before seen—to be operated on as a case of tight organic stricture. Commencing the examination with a full-sized, blunt steel sound, I have been able to pass the latter readily by its own weight into the bladder. This is by no means uncommon in private practice. I have encountered it frequently; and, in many of these cases, the spasm of the muscles of the deep urethra yields to the blunt instrument without any previous cutting of strictures at the meatus or elsewhere in the pendulous urethra, and the spasm itself is due to a cause other than an irritation in the forward parts of the urethra.

Fig. 35.

Passing down, then, after failure of the foregoing manœuvre, from large to small blunt steel sounds, of course skipping several sizes at a time, an obstacle is encountered invariably at the same depth, at the seat of stricture. Locating it positively in this way, after size 10, American (blunt), has been tried in vain, an effort to reach the bladder may be made with a small, soft, black conical bougie, sharp-pointed, not olivary (Fig. 35). Several of these may be tried, and, at last, a Benas bougie, which is simply a thread of whalebone, covered with a kind of black varnish.

If any instrument so far tried passes the stricture, the amount of ease with which it glides through the tight spot should be estimated, the instrument immediately withdrawn, and, unless there be some special reason to the contrary, the patient should be let alone to see what effect will follow the first instrumentation. If urethral fever follows, and especially if the patient has albumen in his urine, all subsequent explorations must be made with special care, and possibly also with the assistance of certain medical aids for the prevention of chill, which I shall mention shortly.

If none of the instruments thus far tried will pass, a very valuable instrument still remains—the filiform whalebone bougie, with the point twisted into spiral, or bent so as to be thrown out of the axis of the shaft of the instrument, as shown in Fig. 36.

A small syringeful of warmed oil is first thrown into the urethra, and then the surgeon feels the anterior face of the stricture with the twisted end of one of these fine whalebones. By advancing the instrument during rotation, with the urethra made tense by pulling upon the penis, the tip of the filiform bougie is presented at different points upon the face of the stricture, and finally, in a skilled hand, is quite certain to find the orifice of the stricture and to enter it. Once entered, the rigidity of the whalebone comes into play, and the instrument promptly passes on and enters the bladder. It is rare, indeed, to encounter a stricture into which one of these slender little instruments cannot be made to pass; nearly all the so-called impermeable strictures yield to them. The main difficulty in their employment is the facility with which the point becomes entrapped in the mouths

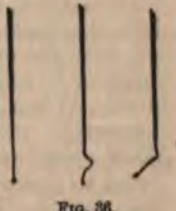

Fig. 36.

of dilated follicles, or of a false passage, should one exist. This defect may in a measure be overcome by the well-known device of crowding the urethra full of these fine threads of whalebone, and then pushing upon them alternately until the one which presents at the mouth of the stricture passes on into the bladder.

Another expedient, which I should feel inclined to try in case of failure to pass a tight stricture, is that recommended by Dr. Hadden, in the New York Medical Record of 1877, July 7th, p. 421. I have not tried it, because I have not failed to pass a stricture since I read the article. The expedient is simple and plausible. It consists in carrying iced water through the long nozzle of a syringe, directly against the anterior face of the stricture, for a few moments, after which, Dr. Hadden says that in his hands a stricture became permeable, which was not so previously. Doubtless the cold sound (p. 269) would serve the same purpose, and it would be easier to manage; and, theoretically, I am not certain that very hot water, carried through the cold sound, would not answer the purpose (of relaxing spasm) still better than iced water.

Finally, if no instrument can be passed, ether may be administered, and the attempt renewed. A filiform bougie, or even a large instrument, may pass under ether when all attempts without an anæsthetic have failed.

By these means a stricture may be located, its permeability ascertained, and its calibre estimated.

TREATMENT OF STRICTURE OF SMALL CALIBRE.

As has been already stated, tight strictures at and near the meatus must be cut. Strictures of small calibre are quite rare in the pendulous urethra. When they do occur, it is probably better, as a rule, to cut them, since they are quite certain in the long run to prove resilient, and require cutting, perhaps, after much time has been lost in attempts at dilatation. If they prove too narrow to receive the dilating urethrotome, their calibre may be safely raised in a few days, by what is known as continuous dilatation (described below), and then, as soon as the urethrotome will pass comfortably, they may be cut.

For all strictures of the deep urethra, dilatation should be the rule, and all operative measures the exception, for the double reason already stated: 1. An operation means danger to the patient, and such a risk his physical condition does not usually warrant; 2. After cutting internally or externally, and after divulsion, a radical cure is not attained in most instances —only relief as a rule, which is made effective by a continuance of dilatation, at more or less prolonged intervals, for an indefinite period.

Dilatation, therefore, is to be employed whenever practicable. This is done much after the manner advised in the case of stricture of large calibre, with the exception that, where soft instruments are used, the intervals may be considerably shortened. Practically, however, the rule is the same. When the effect of one dilatation is at its height, another larger instrument should be gently introduced and immediately withdrawn. With very fine instruments, one day is a long enough interval to be allowed to pass after the first sitting; then the interval may be raised to two, then to three and four days, with advantage. As soon as size 10 American is reached, soft instruments may be abandoned and the dilatation continued with conical steel sounds, as in the case of stricture of *large calibre.*

When, in the case of a very tight stricture, a fine whalebone has been only introduced after many days of patient trial, and especially if there be actual or impending retention, the surgeon's course should depend in a measure upon the character of the stricture, as well as the character of the patient. If the stricture be inodular, complicated with perineal fistula, or very hard and of traumatic origin; or attended by perineal abscess; or (above all) by infiltration of urine; or if the patient be hard to manage, having been partly cured before and then allowed himself to relapse; or if he be urgently pressed for time, or subject to repeated and prostrating attacks of urethral fever (his kidneys being presumably sound) —under any of these circumstances perineal section upon a guide is called for, and should be performed at once or within twenty-four hours. The guide may be tied in the urethra and left there until the operation.

If the case be not urgent on any of the above grounds, while it has been quite difficult to pass the stricture with the filiform bougie, the mild and very efficient expedient of continuous dilatation may be used.

Continuous dilatation is the action exerted upon a stricture by the constant presence of an instrument passed through it. The whalebone, once inserted, is simply to be retained in place by a piece of heavy silk tied tightly around it near the meatus. The two ends of the silk are then tied together so that the knot shall lie upon the frenum just at the curve of the corona glandis, and then the separate ends are carried around on either side under the corona, and tied with moderate tightness upon the dorsum.

In this condition the patient is sent home and told to keep quietly about the house. In twenty-four hours the whalebone may be removed and one several sizes larger introduced with ease. This is in its turn tied in. The patient urinates easily alongside of the instrument. The continuous pressure causes, first, muscular action, spasm, and the bougie is grasped, then relaxation of spasm, then inflammatory swelling, then absorption, and usually suppuration. The second instrument may be left in two days or more. In this way, in a week most strictures (if commenced with very small) may be raised a dozen sizes. The larger the calibre of the stricture, the less promptly, as a rule, does continuous dilatation affect it. After the stricture has reached a certain size, treatment by ordinary dilatation may be commenced; but the intervals must be rather short at first, since a stricture promptly raised to a large size by this method very promptly falls back again if let alone.

There are some cases of tight stricture in which one may be content with simply passing a filiform instrument and not tying it in, trusting that on the following day a larger size may enter, as in ordinary treatment by dilatation.

Finally, there are cases not quite desperate enough to justify external urethrotomy, not able to give the time to ordinary dilatation (although it does not call for a day in the house, much less in bed), and yet urgent enough to justify prompt measures which shall afford speedy relief. For this class of cases two operations remain—internal urethrotomy and divulsion.

Internal urethrotomy of the deep urethra, in my opinion, is not so good an operation as divulsion. The cases in which I have practised it have given me but little satisfaction. The bleeding is apt to be troublesome, and much harder to arrest, I have found, than hæmorrhage from the pendulous urethra. I have never seen a radical cure effected by internal urethrotomy in the deep urethra; many deaths due to the operation are re-

corded in the journals, and many more have not been recorded. In any case the operation is only an adjuvant to dilatation; it prepares the way. I do not by any means condemn the operation; but I do not like it, and I think divulsion better.

If urethrotomy is to be performed internally, probably Maisonneuve's modified instrument is as good as another for the purpose. The grooved staff A (Fig. 37) screws upon a soft conducting bougie, *b*, *d*, or is tunnelled at the end to slip over the whalebone guide, and a rather small knife may be used, B, *a*, preferably with a blunted top to shield the healthy mucous membrane as the knife is thrust along the groove toward the stricture. Without this shield, and sometimes with it, the healthy mucous membrane all along the urethra is more or less cut on the roof or floor of the canal, as the case may be, as the knife is passing down toward the stricture.

Fig. 37.

The after-treatment and means of arresting hæmorrhage are much the same in this operation as after internal urethrotomy of the pendulous urethra (page 305).

DIVULSION.

This operation is not at the present day held in favor to such an extent as internal urethrotomy, probably because it seems to be a rougher procedure. It has the great advantage, however, of calling for less after-treatment by instruments in the urethra, the hæmorrhage is much lighter, and the effect equally lasting. The danger is certainly no greater in this operation than it is in internal urethrotomy, and, for the deep urethra, I consider it the preferable operation.

The best instrument with which to divulse a stricture I believe to be Thompson's tunnelled divulsor, as made in America, capable of being screwed up to size 21, American scale. Fig. 38, *a*, represents the instrument. By turning the handle the blades may be separated, *b*, the amount of separation being registered upon an index in the handle. The instrument is to be used as follows:

The depth of the front face of the stricture from the meatus is at first accurately ascertained. Then a filiform whalebone bougie, twenty inches long, must be passed through the stricture until its distal extremity reaches the meatus, the other end lying coiled up in the bladder beyond the stricture. The urethra now being injected full of warmed oil and the divulsor being well anointed with vaseline, the tunnel is threaded over the whalebone guide, and, while the tip of the guide and the end of the penis are held tense with one hand, with the other the divulsor is slowly to be

pushed along over the guide, through the stricture and into the bladder, until its point of greatest dilatability lies at the centre of the stricture. The outside of the divulsor is marked in inches to facilitate this step in the operation.

It is necessary to take every precaution, in guiding the divulsor into the bladder, not to let it double up the guide in front of itself. To guard against this, during the whole time that the point of the divulsor is travelling the curved part of the urethra the guide should be pulled upon very gently, so that, as the divulsor slips in, the guide is being steadily pulled out. If too much of the guide is used in this way at any time, the divulsor being left in place, the guide may be again pushed forward through the stricture and the tunnel until all its excess is again coiled up in the bladder, and then, by coaxing and gentle manipulation of the divulsor while the guide is being again withdrawn, the steel instrument is carried safely into the bladder, guided by the whalebone.

Fig. 38.

When the divulsor is in place, the guide should be entirely withdrawn and the process of divulsion immediately commenced. The handle of the divulsor may be turned slowly or rapidly. If slowly, it pains, I think, more in the total amount; but some patients prefer it. Occasionally a strong-minded man prefers to screw up the divulsor himself. Generally it is better to screw up the handle rapidly, and save time while the patient's mind is made up to endure the pain, for it is never necessary to use an anæsthetic.

The handle is to be turned until such a grade of dilatation has been reached as shall have been previously determined upon, or until blood begins to flow rather freely from the meatus, indicating that the morbid tissue has been divulsed—torn through. The stricture-tissue is brittle, and, although tough, it tears more easily than the sound tissue, the elasticity of which allows it to escape any considerable injury. Thus, the process of divulsion effects about the same result as internal urethrotomy, with the difference that the torn tissue bleeds less than a similar wound made with the knife would, and has very little tendency to heal up immediately; both of which results in my opinion are very desirable, since they do away with the necessity for a considerable amount of after-treatment which might otherwise be required.

As the divulsor is being unscrewed preparatory to its removal, its handle should be gradually depressed between the thighs, and its point pushed forward into the bladder until the blades meet, when they may be safely withdrawn. Without the exercise of this precaution, it sometimes happens that the closing blades catch a portion of mucous membrane—either the ragged, torn edge of the stricture, or a fold of membrane lower down the urethra, and pinch it so tightly that the instrument cannot be disengaged by again screwing it up. The little piece of mucous membrane in such a case must, of necessity, be torn away before the instrument can be extricated. This accident I have seen happen a number of times. I have never observed that any evil effect followed; but it certainly does no good, and makes the urethra much more sore and

unable to receive an instrument again so soon as it would otherwise have done. It is so easy to avoid this accident by the little manœuvre I have referred to, that it need rarely, if ever, happen. It is certainly better to avoid it.

After the divulsor has been withdrawn, the bleeding invariably stops promptly, and no other instrument should be passed into the urethra. The patient is simply put to bed, and told to remain there from twenty-four to thirty-six hours, after which he may get up and go about his business. If he has no chill within this period, the probability is that all danger is over. If he has a chill, he must be kept longer in bed, and his temperature watched to see whether the chill signifies anything more than ordinary urethral fever.

The question of urethral fever, and of the after-treatment of all operations upon the urethra, will be discussed presently.

After divulsion no instrument should be passed into the urethra until the lapse of from five to eight days. The torn tissues do not tend to unite, as a cut does. The tear suppurates, and it is better not to attempt to pass an instrument over it until granulations have formed and the inflammatory barrier has been erected by nature under the raw surface. Therefore, first upon the sixth or seventh day, an instrument is to be used. Meantime the patient usually urinates freely, and enough suppuration has come on to occasion quite a purulent gleet. The first instrument passed should be an olivary, conical, soft French black bougie, the olive being upon a slender neck, so that when touched with the finger the neck promptly bends (Fig. 39). Such an olive will slip over the angle at the bottom of the tear in the stricture, while a conical point or a steel instrument might readily catch in it, start a quantity of fresh blood, and make a false passage. The shaft of the olivary bougie should be as large as the calibre of the meatus will readily allow to pass.

This instrument, then, well anointed with vaseline, is slowly and steadily pushed downward into the urethra, and if the divulsion has been thorough it should go smoothly forward into the bladder, and its extraction should be followed by the appearance of very little blood. No other instrument need be used for forty-eight hours. Then the same soft bougie may be passed, followed by a conical steel sound of larger size, and from this time onward, on every fourth or fifth day, steel instruments of increasing sizes should be introduced, until the largest size the healthy meatus will take passes smoothly into the bladder without being followed by the appearance of blood on its withdrawal.

Now the stricture may be called cured, so far as any operation will cure it, and the patient should be instructed in the use of a conical steel sound, which he should be ordered to pass for himself once a week, on pain of a return of his stricture. After a time the intervals may be lengthened, and if recontraction does not occur, the sound may be finally abandoned; but there is no certainty how much time must pass before this result is reached, or, indeed, that it ever will be reached. I have known patients, whose intervals, after years of use of the sound, had reached three and four months, and in whom no symptoms of stricture existed, and no evidence furnished by the sound they were using, yet who, from motives of ordinary prudence, preferred to pass the sound three or four times during the year, and intended to continue doing so during the remainder of their lives.

Fig. 39.

The possible complications following divulsion are the same as those liable to be encountered after urethrotomy. Hæmorrhage, however, is very rare, and all the other complications less common, because there is less occasion for using instruments in the urethra; and these instruments, acting upon an inflamed canal, are often more at fault in lighting up complications than the operation itself.

PERINEAL SECTION.

This operation is imperatively called for by tight organic stricture deeply situated in the urethra, under certain circumstances, such as infiltration of urine, perineal abscess, numerous fistulæ, and where the stricture is impermeable to an instrument passed from the meatus.

The latter contingency alone does not necessarily demand external urethrotomy. It is often better in such a case to aspirate the bladder with a fine, perforated needle above the symphysis pubis, once or twice if need be, and then to try the urethra again with a whalebone guide. Some traumatic strictures also of the deep urethra are excessively tough and resilient, so that they will not yield to the divulsor, and do not respond to attempts at dilatation. These must be cut, and a much more satisfactory result may be obtained from an external than from an internal section. Such a complication of stricture as stone in the bladder naturally calls for perineal section, since two maladies may thus be overcome by a single operation.

Fig. 40.

PERINEAL SECTION WITH A GUIDE.

This is as simple an operation as can well be performed. No effort should be spared and no time grudged that may be necessary to effect the passage of a tight stricture with a whalebone guide; the life of a patient may hang upon so slight a thread.

The guide having been passed, the patient should be etherized and bound in the lithotomy position. The perineum should be cleanly shaved. As instruments—besides sponges, artery-forceps, ligatures, a Guyon's tampon (Fig. 40) if deep hæmorrhage be feared, a scalpel, and a straight, narrow bistoury—it is well to have two sizes of Gouley's grooved catheter (Fig. 41, *a*). This instrument is tunnelled, and makes an excellent substitute for Syme's old-fashioned dangerous instrument, with a shoulder of steel and a long, sharp, curved point. A needle-holder is useful with two

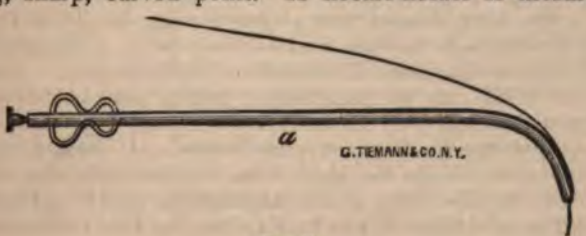

Fig. 41.

curved needles carrying long, stout, waxed silk ligatures at least three feet long. A blunt steel sound, grooved to its tip, which latter should

be tunnelled for the guide, will answer very well if Gouley's grooved catheter is not at hand.

The patient being drawn well to the edge of the table, with his knees up and his hips elevated, the operator sits in front of him, passes the tunnel of the catheter over the whalebone, which has been previously introduced as a guide through the obstruction, and carries it down to the face of the stricture. He then, with the scrotum and testicles drawn well up out of the way, entrusts the instrument to his first assistant, and proceeds to cut down methodically in the middle line, layer after layer, aiming for the tip of the sound, which of course represents the anterior face of the stricture. As soon as the tip of the sound has been exposed, the curved needles are deeply inserted on either side through the skin and deep tissues, and brought out through the urethral mucous membrane, just in front of the anterior face of the stricture, near the tip of the sound. The needles being removed, each ligature is knotted to itself, so as to form a loop on either side. The loops are entrusted to two assistants. They form the best possible means of keeping the wound open without the use of fingers or instruments, which obstruct the light, and allow the whole bottom of the deep wound to be freely inspected, showing the end of the guide disappearing through the stricture, among the tissues which have stopped the tip of the tunnelled catheter.

It is now but the work of a moment. A little delicate dissection in the middle line, following the black guide, and the operation is over. Care is necessary not to cut off the slender whalebone in the wound. The catheter may now be easily slid forward into the bladder, and the removal of its stylet allowing the urine to flow freely through it, demonstrates the success of the operation.

The catheter should now be withdrawn, and the site of the stricture examined. If this has involved the roof as well as the floor of the urethra, a bridge across the roof, generally with a slight pocket above and in front, will be noticed. This should be thoroughly cut through, or it may prove a serious obstacle to the introduction of sounds while the wound is healing. On one occasion I saw this operation performed by an experienced surgeon. He neglected to cut this bridge in the roof of the urethra, and, as a consequence, was unable to pass sounds afterward. The operation had to be repeated under ether before the patient was put in a position to recover. The importance of this little step in the operation becomes apparent when it is remembered that, the floor being cut, the roof of the urethra is the only safe guide to the bladder after the operation of perineal section.

Bleeding points next require attention, and finally, the bladder should be thoroughly examined for stone, and the finger should assure the operator that all the hard, fibroid tissue constituting the stricture has been thoroughly cut through at each end of the wound. The pendulous urethra should also be examined for stricture, which should be cut if found; and, above all things, the surgeon must convince himself that he can easily pass a full-sized conical steel sound into the bladder through the meatus, and without putting his finger into the wound. If he cannot do this he should find out the reason for his failure, and so study the urethra that he may become familiar with all its peculiarities, and thus become master of the situation; for these things he may not be able to investigate after the patient has aroused from his anæsthetic.

The application of a tampon is very rarely required. If one is placed, *it should* be perforated centrally by a catheter; or, if Guyon's rubber tam-

pon is used, the catheter forms part of the instrument. Under no other circumstances is it allowable to leave any instrument whatsoever in the bladder, either passed through the wound or through the urethra. Such instruments are wholly unnecessary. Their use serves only to give the patient discomfort and fever; they inflame the urethra, so that it cannot readily take a full-sized instrument while the wound is healing, and thus greatly mar the ultimate success of the operation. They cannot protect the cut surfaces from contact with the urine, and are far more an occasion for high urinary fever than a protection against it. In short, any catheter left in the bladder is a source of pain and danger to the patient, and an annoyance to the surgeon. Although its use is still advocated in some quarters, I am unable to discover upon what grounds it is advised, and having seen it occasionally used in hospitals, I cannot refrain from totally condemning it. The wound should be left open for the passage of the urine, and the after-treatment should be conducted upon ordinary surgical principles, so far as attention to the wound, to fever, to diet, etc., is concerned. The scrotum must be strapped up well out of the way of the wound, or it may become excoriated, œdematous, perhaps infiltrated with urine.

In twenty-four hours, before suppuration has become fairly established, a full-sized conical steel sound should be gently carried into the bladder from the meatus, following the roof of the canal. This serves to overcome the tendency of the cut surfaces to rapid union. After an interval of forty-eight hours, another sound may be passed, generally one or two sizes smaller. Then, at intervals of three or four days, the largest conical steel sound that will go, should be gently carried through the whole course of the urethra into the bladder, and this continued at gradually lengthening intervals until the wound has healed—a time generally varying from three to six weeks.

It is by no means necessary, however, to confine the patient to the house, much less to his bed, during the whole of this period. His perineal wound is a matter of little importance. A greased rag, some oakum, and a **T**-bandage will keep him perfectly clean, and he may get up when he feels inclined, and walk about. I have had an old man past sixty, whom I cut most extensively in the perineum, up, dressed, and walking about upon the eighth day. This would not have been at all possible had any instrument been left in the bladder after the operation.

Finally, when the patient gets well, he must be taught to use a full-sized conical steel sound for himself, once a week, just as after internal urethrotomy or divulsion practised upon a tight organic stricture in the deep urethra, or his cure may not be lasting. Many a patient relapses into a condition of impermeable stricture, after having been thoroughly cut in the perineum, either because his surgeon has not impressed him with the necessity of using sounds, or because he himself has been negligent in his duty. I have cut a number of such patients, who had already undergone the operation several years previously.

What comment more striking than this is necessary to confute the claims of those who assert that internal urethrotomy, if only the incision be deep enough, will radically cure stricture? Here all morbid tissue is cut under the eye, including the healthy tissues and skin, and yet recontraction follows, unless a sound be continuously used. Stricture of large calibre in the pendulous urethra is one thing; deep organic stricture is another.

But recontraction is not invariable after perineal section. I cut with-

out a guide, about nine years ago, a boy with impermeable stricture, retention, and overflow, who had already been cut by a surgeon two years previously, in the perineum, for the same stricture. The patient had fallen on the crotch when a child, and crushed his perineum, a part of which, with some of the urethra, had sloughed away. After his first operation, sounds had been passed seven times by his surgeon, on each occasion under an anæsthetic, and then the boy had been told he was well.

In this case I followed the patient up, and have seen him this year (1879). For a year or more, a sound was passed weekly without ether, then at gradually lengthening intervals, until, six years after his cut, the sound was passed only once a quarter. Then six months went by, and there was no recontraction; finally, after an interval of a year, the boy, meantime, having grown enormously and developed in every way, I examined his urethra, and found that the strictured point was two sizes larger than it had been the year before, at the last examination. I then considered him cured, and he has remained perfectly well, so far as his urethra is concerned. This case is certainly exceptional. I only refer to it as an authentic instance of cure of deep organic stricture after perineal section.

PERINEAL SECTION WITHOUT A GUIDE.

This operation is a formidable one on account of the element of uncertainty which it involves. Generally it is finished quite promptly, even under the employment of great care and all known means to insure the safety of the patient; yet the best surgeons have worked hours over a case without reaching the bladder. An excellent surgeon in New York, on one occasion, failing to enter the bladder, when daylight deserted him, at the close of an afternoon's hard work in cautious attempts to find a way into the bladder in such a case, sent his patient back to the wards, and announced to the surgeons standing around that the operation would be resumed at two o'clock on the following day. Generally, I repeat, the operation without a guide is easy to a cool-headed surgeon, only a few minutes being required after the front face of the stricture is exposed before a passage into the bladder is obtained; but, in spite of this, no one can afford to laugh at the difficulties of the operation, and no prudent surgeon will undertake it without an abundance of daylight before him. One incident, which I witnessed, may serve to impress the reader, both with the difficulties occasionally encountered in the operation, and with the folly of those who pretend that a guide should be used only by beginners. No reputable surgeon can afford to disregard any aid to an operation which gives the patient a greater chance for his life. All operations upon the deep urethra are capital, and involve the issues of life and death.

The case I have just referred to is the following: a young, but perfectly competent surgeon, attempted perineal section without a guide, in a case of impermeable stricture. After long and cautious work he failed to reach the bladder, having passed under and to one side of the membranous urethra, and reached just beyond the apex of the prostate. The patient had no retention, and the surgeon, after appealing to those around him, determined to postpone any further work for the day, when a surgeon in high position and with a widespread reputation as a general operator, entered the operating-room. He was told the condition of affairs, called for a silver catheter, passed it through the meatus, put his finger *into the* wound and manipulated for a moment. Presently he depressed

the handle of the catheter with some force, and called for a bowl. Clear urine flowed through the catheter, and with a smile of satisfaction, amid a spontaneous burst of applause from the assembled doctors, the surgeon withdrew.

At the autopsy on the following day a round hole was found passing through one lobe of the prostate into the bladder.

The operation of perineal section without a guide calls for the same preparations as if a guide were to be used. A few fine probes, directors, and a female catheter, are also necessary. A last attempt under ether should always be made to pass a whalebone guide. Failing in this, the grooved sound or catheter is introduced as far as the front face of the stricture, entrusted, with the scrotum, to an assistant, and central incisions are made as before, the point of the sound exposed, the long threads passed, and the loops handed to assistants.

Now the operator carefully, with fine whalebone or silver probes, searches cautiously on the front face of the stricture for the way through into the bladder. To aid him he may enlarge any existing perineal fistula, and try by that route to reach the posterior face of the obstruction within the urethra. Posterior catheterism has been and may again be tried from the bladder through an opening made above the pubes, or puncture of the (perhaps) dilated urethra behind the stricture; but I think that neither of these processes is advisable for general use.

Usually the best guide to the bladder is a clear anatomical understanding of just where the hole in the triangular ligament is, and in what relation that hole stands to the lower edge of the subpubic ligament. This lower edge of the subpubic ligament can always be felt; and beneath it, exactly in the middle line, about three-quarters of an inch below the symphysis, varying a little in different subjects, lies the hole in the triangular ligament. This hole is generally the operator's objective point. The tendency is to cut too much at first and to probe too little, until the operator loses his bearing in the solid mass of tissues matted together by prolonged inflammation; and once fairly off the track, he rarely recovers his position by any other means than accident. Patient and judicious probing, with a little careful cutting in the anatomical position of the closed urethra, is generally rewarded with prompt success; the probe soon passes on without obstruction for a considerable distance in the direction of the bladder, another probe may be pushed alongside of the first, and a separation of these two allows a little bloody urine to flow out. The tight ring surrounding the probes may now be carefully followed up with the knife for a short distance, the area of the canal widens, a female catheter passes readily alongside the probes, and a gush of bloodless urine through it announces that the bladder has been reached.

One of the most common causes of failure in this operation is the existence of a false passage, starting from the front face of the stricture, the result of some former rude attempt to pass the stricture with a solid instrument. The surgeon may be led on by such a false route far astray, and find his mistake only after he has hopelessly lost his bearings among the diseased tissues. It is well, therefore, not to follow up any inviting sinus without first dilating it a little and learning whether it leads in the proper direction.

After the bladder has been reached, the operation of perineal section, with and without a guide, are one and the same. No further description of the remaining steps is therefore necessary, since they have been already given. I desire to repeat here, however, that on no account is any

instrument to be left in the bladder after the operation; and on no account is the patient to be discharged as cured until he has been taught to pass a full-sized conical steel instrument for himself, and has been impressed with the necessity for doing this with regularity, at weekly intervals, until he can demonstrate to the satisfaction of a surgeon that no further recontraction is taking place.

URETHRAL FEVER.

All operations upon the deep urethra contain an element of danger to life. The simple passage of a catheter, the introduction even of a single smooth sound, has been followed by death within twenty-four hours, the patient dying with a high temperature, following chill more or less severe and prolonged, and the autopsy showing nothing worse, as a lesion, than the remains of a passing congestion of the kidneys. These, of course, are extreme cases.

Ordinary urethral or urinary fever, however, is very common. It comes on with a chill, sometimes only a cold sensation, and this chill ushers in a fever. The chill may occur during the operation or just after it, or anywhere within the twenty-four hours—rarely later; perhaps from six to twelve hours after the operation is the time during which chill is most often observed.

This chill, and the succeeding fever and sweat, commonly mean nothing. They leave the patient prostrated, and feeling weak and miserable for several days, often with a crop of herpes about his mouth. Such attacks of urethral fever occur as well after the simple passage of an instrument which brings no blood, as after the most severe operations. Their cause is unknown. They are far more common in patients with defective kidneys than in sound men, and more frequent, I believe, in nervous, impressionable people than in others, especially if fear of the result was felt at the time of the operation. Nervous shock, reflected from the point operated upon to the rest of the body, and especially to the urinary system, seems to be at the bottom of most of the cases. If the kidneys are sound, no evil results beyond temporary depression; if the kidneys are defective, death may rapidly ensue. Hence the necessity of making up one's mind about the probable structural condition of the kidneys before attempting any operation upon, or even exploration of, the urethra.

And yet diseased kidneys do not necessarily render a patient unfit for an operation. Many a severe operation is done of necessity, upon the urethra and bladder of patients well known to have defective kidneys, and they escape without a chill.

There seems to be some connection between slight over-distention of a stricture and urethral fever. Thompson mentions the fact, and I have seen cases where a patient will do well enough while using a certain sized sound, but where each attempt to employ a larger size has been followed by a chill.

In one such case, an old gentleman, finding that dilatation could not be pushed on account of the recurrence of urethral fever, I employed divulsion with the effect of curing the stricture by splitting it, and that, too, without giving the old man any chill at all; so that it cannot be the violence of stretching alone which causes chill in these cases, but some persistence of irritation in the stretched fibres, for when the fibres are broken *by divulsion,* no chill, of necessity, follows.

It certainly is not urinary absorption, as the French have claimed, which causes urethral fever. The meatus may be widely cut on the floor, at a point where absorption is known to be most active and the lymphatics very abundant; yet it is the rarest thing in the world for any urethral fever to follow this operation if no instrument be used farther down the canal, and this, too, in spite of the fact that the urine may be ammoniacal or even putrid. Many old men with diseased bladders, perhaps passing blood in considerable quantities, from raw surfaces kept irritated by the constant use of the catheter, do not have any urethral fever at all for weeks, when on some occasion, perhaps so slight a one as a simple exploration of the urethra, often without known cause, a sudden attack of urethral fever will come on.

Consequently, we do not know accurately what urethral fever is, or why it comes at certain times and not at others, or why the same apparent combinations of causes will not always produce it. But this much is known quite certainly: that (1) the deeper down the urethra an operation or exploration extends, the more likely is urethral fever to follow; (2) operations near the meatus very seldom cause urethral fever; (3) overstretching a stricture without rupturing it is more apt to cause the fever than when the fibres are divulsed or cut; (4) one attack by no means presupposes another, though the same causes may be brought into play; many a patient has one attack of urethral fever at the beginning of his treatment for stricture by dilatation, and never is troubled again, although the treatment by dilatation is continued; (5) other things being equal, fever and nervous impressionability make urethral fever more apt to occur after interference with the urethra; (6) organic kidney disease makes urethral fever more likely to occur, and more apt to prove fatal, than if that condition did not exist; (7) the occurrence of urethral fever cannot be ascribed to urinary absorption.

One very serious obstacle to a successful study of urethral fever is that there is no means of knowing whether a given chill following an operation on the urethra or bladder is a chill of urethral fever, or due to some other cause—that is, there is no important or essential difference in the chill itself. Thus, an outbreak of malaria following an operation on the urethra is usually mistaken at first for urethral fever; and so also with any chill which may be a starting-point of pyæmia, of epididymitis, cystitis, or of some other malady having nothing to do with the urinary organs. As a general thing it may be said, however, that the chill of urinary fever comes certainly within twenty-four hours of the immediate cause—the injury to the urethra—while chills having some other significance come later, as, for instance, the chill at the beginning of surgical fever following perineal section.

Finally, it may be said of true urethral fever that there is a certain habit about it in some patients. I have known a hospital patient, who persistently through a number of weeks after instrumentation had sharp urethral fever, a temperature reaching 105° Fahrenheit and prostrating him for days, who had his fevers warded off by the treatment which will be given below; and then, after having an instrument passed a few times and escaping chill by these means, it became possible to introduce a sound without taking any precautions, and still no chill followed.

The study of this malady is curious and instructive, but not very satisfactory, because so uncertain.

Something can be done, however, toward warding off urethral fever and modifying its intensity when it does occur.

Treatment of urethral fever.—The most important treatment is such as shall prevent chill, when it is found necessary to operate upon a given urethra. Quinine, formerly much used, is not to be depended upon. I cannot say that it is without value, but long experience with it has made me unwilling to trust to it alone.

If a patient has casts and albumen in a specimen of urine which does not contain blood, he should be prepared beforehand by treatment for his exploration or operation, as the case may be. He may receive with advantage, for several days before the operation, a mild, thorough diuretic, such as a tablespoonful of the infusion of digitalis containing twenty grains of the citrate or of the acetate of potash, during the third hour after each meal, and he should be encouraged to drink milk and plenty of bland fluids—a laxative being added if necessary; this will put him as near as may be on a par with other patients.

On the night before an operation a laxative should be administered, and ten grains of quinine about two hours before the operation, to get from this drug whatever advantage it may possess, be that advantage little or great. Fifteen minutes before the operation, ten minims of Magendie's solution of morphia may be thrown under the skin, and immediately after the operation fifteen to twenty minims of Squibb's fluid extract of jaborandi may also be inserted under the skin. Among these remedies I estimate as most important the morphine, next the jaborandi. With the jaborandi alone I have succeeded in stopping chill in persons who had chill habitually whenever the urethra was interfered with. My experience with jaborandi, however, is quite recent, and I am unwilling to rank it very high as a preventive of chill, for fear that a more extended trial may disappoint me in my estimate.

If chill comes on, it is best treated, I believe, by the immediate administration, during the cold stage, of twenty minims of chloroform, to be repeated in fifteen minutes if the chill has not disappeared or is not sensibly modified. A small subcutaneous dose of morphia may be administered at the same time. Chloroform is best given in glycerine and water. If the chloroform be first thoroughly mixed with about four parts of glycerine, it may be afterward diluted to any extent with water, without becoming separated and falling to the bottom of the glass, as chloroform ordinarily does when thrown into water. This mixture is quite sharp to the mouth, and requires plentiful dilution with water. As soon as the chill breaks, a warm drink, preferably without alcohol, aids in starting the perspiration and helps to shorten the attack. By a judicious application of these means, ordinary urethral fever may be much modified.

Not so, however, I fear, in malignant cases—those which kill in twenty-four hours. I have not encountered such a case for many years, but their character is so desperate that it seems hopeless to do anything. In one case which I had an opportunity of observing closely, the chill—a sharp one—followed the operation (internal urethrotomy) promptly, and was intense in character. High fever came on rapidly, with profuse purging and vomiting, intense headache, and delirium. Death quickly ended the scene. One ureter was found occluded, and both kidneys diseased. The case was one of unavoidable operation, and a record of it was published at the time.

During the after-treatment of operations, urethral fever is not very apt to come on, whether it has or has not attended the operation. During all such after-treatment, it is desirable to keep the urine bland and unirritating, by the use of plenty of watery fluids, abstinence from alcohol in

any shape, and the use, if need be, of the citrate of potash in moderate (gr. x.) doses during the third hour after eating, three times daily, largely diluted with water. I have sometimes thought that the influence of cold, of indigestion, and possibly even of moral emotions, put a patient into a condition where he was more apt to have urethral chill than when his mind was easy, his stomach content, and his nervous system not depressed.

CHAPTER VI.

GONORRHŒA IN THE FEMALE.

Symptoms, Complications, Treatment.—Local Treatment.—How to wash the Vagina.—Medicated Vaginal Injections.—Chronic Urethritis and its Treatment.—Chronic Cervicitis.—Sterility in Women following Gonorrhœa.

GONORRHŒA in the female is generally an intense vaginitis. A vaginitis may occur which is not due to the contact of gonorrhœal pus, produced perhaps by prolonged and excessive irritation in sexual intercourse, by masturbation, and in various ways; by rape, or by the violence of sexual intercourse during the first approaches where there is no rape. Again it may be due, especially in young children, to the presence of thread-worms, which have escaped from the anus and reached the vagina. It may also be found in a more or less acute or chronic state in connection with uterine diseases of various character, with pregnancy, or with syphilis due to mucous patches, and the acrid discharges therefrom. Indeed, there are a great variety of causes capable of producing vaginitis, which are themselves not at all gonorrhœal. Yet the same statement may be made regarding these inflammations as was made concerning urethritis in the male, namely, the inflammation is apt to run higher in true gonorrhœa than when the cause is not virulent; but the treatment, under all circumstances, is to be graded according to the intensity of the inflammatory process, and not according to its cause.

Gonorrhœa in the female does undoubtedly attack many other structures besides the vagina. Both sets of labia may be included in the inflammatory process; the vulvo-vaginal gland on either side is frequently attacked; the urethra does not always escape, and the malady may involve the bladder; finally, the uterus and the ovaries may also pay tribute to the general inflammation, and that, too, in a most serious manner.

Symptoms.—The first symptoms of gonorrhœa in the female come on shortly after the application of the cause, if that cause be a combination both of local violence and of virulent pus, as is often the case. When, however, there has been no violence, the period of incubation is of several days' duration, as it is in the male, after which the patient makes complaint of a feeling of heat, weight, and itching about the vulva. This is attended by smarting during urination, not because the urethra is the seat of disease—although it may also be involved from the first—but because the ostium vaginæ, the labia minora, and perhaps the orifice of the urethra are swollen, inflamed, excoriated, sensitive, and are scalded and irritated by the contact of the acrid urine.

A secretion of pus soon begins to show itself. This flowing out mats the hairs together, and partly drying into sticky scabs upon the vulva, mixed with sodden epithelium and rancid sebaceous matter, goes into rapid decomposition, and emits a disgustingly offensive odor. The labia become excoriated and swell up with œdema, so that walking or sitting may become quite painful.

Meantime, should the inflammation travel down the ducts, as it may, and take possession of one or both of the vulvo-vaginal glands, a serious complication ensues in the shape of a slow and painful suppuration of the gland, which may so increase the local swelling and pain, as to make walking practically impossible.

The amount of pus discharged increases rapidly. It becomes thick, green, and offensive, perhaps mingled with blood. In acute cases the inside of the vagina becomes raw and painful, so that any attempt to introduce a distending instrument into the canal occasions great pain.

This condition of affairs may continue for several weeks, prolonging itself for months, perhaps, in debilitated patients in a subacute or chronic form. The duration of the malady is greatly influenced by treatment. An uncomplicated case, although quite acute, ought to be practically under control in from three to five weeks.

Should the uterine canal take fire, as it may, intra-uterine inflammation, abscess of the Fallopian tubes, ovaritis, and pelvic-peritonitis are among the possible complications. They are not very common, but they do occur, leading sometimes to a fatal result. The symptoms of these various maladies find their description naturally in text-books devoted to the consideration of uterine disease. There is nothing peculiar or special about them to rank them as venereal in any sense, excepting that of coincidence, and the nature of the cause does not modify the treatment ordinarily applicable to the same morbid states due to other causes not venereal. Consequently, there is no occasion to do more than mention these possible complications here.

Such other complications, as vulvar abscess, not in the vulvo-vaginal gland, peri-vaginal suppuration and abscess of one or more of the inguinal glands, are exceptionally uncommon with vaginitis, although occasionally encountered.

Treatment.—Rest and absolute cleanliness are two factors essential to the proper treatment of vaginal inflammation. The patient should be forced to keep her bed. This she will the more willingly do as the grade of the inflammation runs high, since very often the pain on attempting to get about is considerable.

No collection of pus about the vulva should be allowed. The parts should be constantly washed with mild (half of one per cent.) solutions of carbolic acid, or a little Labarraque solution in water, or with water tinted to a faint purple with permanganate of potash. Thin cloths, moistened in one of these solutions, should be kept constantly upon the vulva. It is well also, for the sake of cleanliness, to cut away the hairs. Frequent warm sitz-baths of short duration, one every two to three hours, are very useful, and are comforting to the patient as well.

Should abscess form in the vulvo-vaginal gland, no modification in the treatment is called for. A poultice is not necessary, and does not give any more relief than the moist applications and the warm local baths used for the sake of cleanliness. When pus forms it may be let out by a free incision, but the integument should not be incised until the pus has nearly reached the surface, since abscess in this region frequently disappears by absorption. Sometimes the abscess discharges through or alongside the duct.

After abscess of a vulvo-vaginal gland has discharged spontaneously, or has been opened by the surgeon, the thickening about the gland continues for a long time, and the opening remains fistulous. The discharge from such a fistula may get to be very annoying, and the pus which flows away

is believed by many long to retain infectious properties. When, therefore, this condition of things exists, and seems likely to continue, three courses are open to the surgeon: injection by iodine, cauterization, excision.

Injection by iodine cannot be relied on. In some mild cases, however, in atonic subjects it may so stimulate the sluggish cavity of the abscess as to produce granulations which fill it up if the fistula be dependent, so that the discharges may drain away as soon as formed.

Incision with cauterization is an effective means of curing these chronic abscesses. The incision should involve the opening (or openings if there be more than one), and lie in the long axis of the labium. It should be very free and largely open up the cavity of the abscess. After arresting the flow of blood, the fistula and abscess should be thoroughly cauterized, either with pure nitric acid, a stick of nitrate of zinc, chloride of zinc, or nitrate of silver, or any efficient caustic, the point being to do it thoroughly. Cauterization may be very efficiently performed in these cases with a Pacquelin's naphtha cautery, or with the electro-cautery. The wound may be packed with carbolized cotton or oakum, and poulticed after forty-eight hours to assist the separation of the slough. As soon as the wound cleans up it may be dressed with pure balsam of Peru, and usually goes on at once to rapid granulation and cicatrization.

Excision is equally or more effective than the preceding treatment, and quicker in its results. It consists in cutting down in the long axis of the labium upon the inflamed hard tissues, representing the remains of the gland and dissecting them out bodily. The wound is dressed simply and left to granulate.

But to return to the acute gonorrhœa in the vagina—local treatment must be relied upon for its cure. An alkaline diuretic may be administered by the mouth to make the urine less scalding when it comes into contact with the abraded vulva; but the balsams, so useful in the male, are of little or no value in the female, because the urethra is not the main seat of the disease. Some good may be effected by these remedies in gonorrhœal conditions of the urethra and bladder, but they do not control the main malady—vaginitis.

The abortive treatment of vaginal gonorrhœa, once much vaunted, does not seem to hold its place in the estimation of authors. Certainly it often fails, and when it fails the patient's condition is worse than if it had never been tried. Its value is so problematical that it cannot be recommended.

The rational local treatment of gonorrhœal vaginitis is one which regulates the strength of the local application by the stage and intensity of the inflammation, and the effect produced. Cleanliness within the vagina is as necessary as it is outside. The pus must be washed away from the irritated mucous membrane, and the oftener this is done the better. All instrumentation within the vagina is painful during the acute stage of gonorrhœa, but nevertheless, no washing of the canal can be effective except through an instrument introduced well up to the cervix. Nothing is better for this purpose than the ordinary glass vaginal tube of the common fountain syringe. Davidson's syringe has the defect of throwing in the fluid spasmodically and with too much force both for comfort and the safety to the uterus.

Washing the vagina may be conveniently effected as follows: The patient lies flat upon the back, with the hips raised several inches higher than the shoulders, and the buttocks resting either in a bedpan or upon

a large rubber sheet in which a crease is made for the purpose of conducting the fluids as they flow out of the vulva over the side of the bed into a vessel suitably placed to receive them.

A large fountain syringe (or simple rubber bag with rubber tube and long glass nozzle), filled with water as hot as can well be borne by the vagina, varying from 98° to 110° Fahrenheit, or more in some cases, being ready, the glass vaginal nozzle warmed and well oiled is slowly introduced carefully along the posterior vaginal wall until its point has been carried well up into the vaginal pouch behind the posterior lip of the uterus. In this pouch secretions are apt to collect and to remain, since ordinary irrigation hardly reaches them.

As soon as the glass tube is in place, the rubber bag is to be gently raised, and shortly after the pus and water begin to flow away at the vulva, it is again to be raised higher so that the force of the flow of water may be increased. If the end of the tube lies behind the posterior lip of the cervix the force of the flow cannot do harm. The position of the body and the gradually increasing and finally maintained force of the flow of fluid first distends the vagina fully, and then washes it out thoroughly from its deepest part.

After one bag of water has flowed through the vagina, if the pus has not been all washed out, the bag may be refilled and the process repeated. This vaginal washing may be renewed several times during the twenty-four hours, more or less frequently according to the rapidity of pus formation.

Instead of using simple hot water with which to wash the vagina, a little salt may be added, or chlorate of potash or borax, one to three teaspoonfuls to the pint, not strong enough to produce any effect of which the patient may be made conscious by her sensations.

From the very commencement of the treatment medicated injections may be employed, after the vaginal wash, for the purpose of restraining the activity of the pus formation, and keeping the inflammation within reasonable bounds. These injections should never be made from without, inward, or into a vagina full of pus, but should be thrown gently into the depths of the vagina after the canal has been washed. The injections are to be made preferably with the same tube through which the washing has been effected. The medicated injection must, therefore, be put either into the fountain syringe after the water has all escaped, or the tube may be uncoupled and fitted by a piece of rubber to whatever syringe it is proposed to employ. It is better not to withdraw the vaginal tube for the purpose of introducing another.

The substances to be employed with advantage in the vagina are similar to those found useful in the urethra of the male. It is not well to try a great number, one after the other, but to use one or two, varying the strength according to the effect. In watching the effect of an injection, it is always well to commence with a mild solution, and to increase the strength, if it is well borne, until it either modifies the quantity of the pus or commences to produce irritation. If the former result is reached, the injection is doing good; if the latter, it must be abandoned and another one tried. Medicated injections should always be heated before being thrown into the vagina, and they should be introduced in a continuous stream, flowing without much force. The substances which may be employed in solution, in the acute stage of vaginitis, are dilute lead-water; pure sulphate or chloride of zinc, commencing at half a grain to the ounce of water and increasing; lactic acid, half a minim to the ounce and increas-

ing; bisulphate of quinine, one grain to the ounce and increasing, dissolved in the smallest possible amount of dilute sulphuric acid; or picric acid (Chéron), one grain to four ounces and increasing.

When some headway has been made in reducing the quantity of the discharge, or making it thinner, other injections may be tried, such as solutions of tannin, alum, red wine, and water, commencing with a weak solution, and running up the strength while the effect is watched.

As soon as the inflammatory process has so far subsided as to allow the introduction of a speculum, any convenient instrument may be used by the aid of which the walls of the vagina may be thoroughly inspected after the canal has been washed, and the eroded spots of congested membrane may be directly touched with a strong solution of tannin or a moderate solution of nitrate of silver. Such topical applications should be repeated daily, the strength of the solutions being graded according to the effect. At this time, also, advantage may be derived from the use of tampons of absorbent cotton which may be introduced, of small size, through the speculum. Several small packages should be tied up along a string, like a kite-tail, to facilitate withdrawal, for the purpose of absorbing the pus as it is formed, and keeping the inflamed surfaces apart. The various forms of absorbent cotton may be used in this way—that prepared with carbolic or salicylic acid, with alum, iron, sulphate of zinc, etc.—or the physician may apply powders or solutions of any strength, upon one of these small tampons. By these means, without discomfort to the patient, a constant application of any substance desired may be maintained.

Finally, when the discharge has nearly ceased, the spots from which it exudes must be sought out by the aid of the speculum, and treated by gentle pencilling with nitrate of silver, or by astringents directly applied. Chéron thinks well of the application of pure glycerine to inflamed surfaces in the vagina.

The different forms of vaginal suppository, found in the shops, do not yield as satisfactory results as might be expected of them. They seem appropriate, but like the urethral medicated bougies for the male, they do not perform as well as they promise.

The internal treatment of gonorrhœa in the female is mainly symptomatic. Food must be light at first, because the patient is put upon her back and deprived of exercise. Later the food must be strengthened in quality. Laxatives have to be employed, and, finally, perhaps tonics and stimulants.

A lingering, chronic urethritis, giving no symptoms of which the patient is conscious, but yielding a drop of pus to pressure, upon the urethra from behind forward, in the intervals between urination, and tending to prolong itself almost indefinitely as a chronic contagious malady, is spoken of by authors. As treatment, a mild solution of picric acid (one grain to four ounces and increasing) may be injected into the bladder, as advised by Chéron, and afterward slowly voided through the urethra by the voluntary effort of the patient, or, what is better, a solid pointed stick of nitrate of silver may be rapidly passed through the urethra and immediately withdrawn, the process to be repeated once or twice, at intervals of about a week.

The chronic discharges from the canal of the cervix and from the uterus, which are sometimes left behind by a gonorrhœa, belong to the domain of the uterine specialist and yield to the same means that are used successfully to overcome other discharges due to causes not in themselves virulent.

It has been claimed that gonorrhœa in the female is a fertile cause of sterility, that it lingers indefinitely in the uterine neck, so modifying the secretions that the spermatozoa are both mechanically impeded and chemically devitalized before they can reach the ovum. It does not seem to me that this point is sufficiently proved to be accepted. Gonorrhœa is certainly very uncommon among respectable women, and particularly common, according to my experience, among respectable men. Men are certainly sometimes rendered sterile by gonorrhœa, by the mechanism of obliteration of the duct of the testicle as already described. But even in men this result is very exceptionally uncommon, and in women it seems to me that it must be equally uncommon, or even more so. In prostitutes who have gonorrhœa, there are other causes of sterility aside from gonorrhœa which are capable of explaining the immunity from conception possessed by many of these women.

CHAPTER VII.

COMPLICATIONS OF GONORRHŒA COMMON TO BOTH SEXES.

Gonorrhœal Rheumatism.—Time of Occurrence, Cause, Parts most often Involved.—Chronic Hydarthrosis.—The Poly-articular Form.—Neuralgia.—Bursitis.—Nodes.—Treatment.—Gonorrhœal Rheumatic Iritis, Conjunctivitis, Aquo-capsulitis.—Contagious purulent Ophthalmia, its Symptoms, Course, and Treatment.

THERE is a form of rheumatism found in connection with gonorrhœa, having peculiar characters, subacute in form, very chronic in duration, and dependent upon the gonorrhœa as a cause. How gonorrhœa causes rheumatism is not known. It is believed to be by a process analogous to a mild pyæmia, but this explanation is hardly sufficient. Women have gonorrhœal rheumatism with exceptional rarity, and this has been explained on the ground that the vagina and not the urethra is the common seat of gonorrhœa in the female. This is obviously no explanation, but simply the statement of a fact.

A rheumatism, with certain qualities to be shortly described, attacks certain patients when they have gonorrhœa, and at no other time. It runs a course peculiar to itself, does not yield to the ordinary remedies which are effective against rheumatism, and is not attended by several of the phenomena accompanying ordinary rheumatism. It alternates sometimes with troubles in the eye resembling rheumatic affections of that organ, and seems to be due to an idiosyncrasy on the part of the patient rather than any constitutional tendency he may have either to rheumatism or to gout. The malady itself, be it said, resembles rheumatic gout more than it resembles either true rheumatism or true gout.

The time of occurrence of rheumatic symptoms complicating gonorrhœa is very variable. Fournier places the most common period between the sixth and the fifteenth days of the discharge. It rarely comes earlier than these dates, but may be found very much later, in which case its advent is usually preceded by an increase in the quantity and in the thickness of the discharge. After joint complications have set in, the discharge usually abates somewhat, but it does not cease, as it does when certain other complications occur, *e.g.*, an intercurrent attack of epididymitis.

The cause of the malady is the existence of gonorrhœa. Beyond this, nothing is necessary. Cold, a wetting, exposure, diathesis, wrenching a joint, privation, bad hygiene, none of these causes need be invoked to explain it. The peculiar idiosyncrasy, whatever that may be, is all that is necessary. Fortunately few possess it.

The parts most often involved are the joints. Then come the sheaths of tendons, muscles, the structures of the eye, the bursæ and the nerves. Cases of gonorrhœal pericarditis, endocarditis and meningitis are also on record.

According to Fournier the sterno-clavicular articulation is a very constant seat of gonorrhœal rheumatism, the knees very often suffer, the ankle comes next, and then the fingers and toes. The bursæ, the tendons, and the muscles are involved in an irregular manner in connection usually with troubles in the joints which overshadow them in importance.

One of the most common forms assumed by this malady is that of a chronic hydarthrosis, most often attacking the knee-joint. This form is generally mono-articular and is apt to relapse in the same individual during different attacks of urethral inflammation. In a case of bad stricture under my care, the stricture being in the membranous urethra and having been treated by perineal section, the patient during a number of years being careless in his habits and inclined to drink, had repeated attacks of urethral inflammation not by any means always due to venereal causes. With each attack of suppurative urethritis he suffered simultaneously with some form of gonorrhœal rheumatism, and among these had three or four attacks of hydarthrosis of one or both knees; he had also, at different times, the ocular, bursal, tendinous, arthritic, and muscular symptoms of gonorrhœal rheumatism, and rarely escaped in less than several months from any attack. My observations embrace a considerable number of cases of gonorrhœal rheumatism, and among them hydarthrosis of the knee has been very common. The ankle and the elbow suffer in the same way, but very much less commonly.

Taking the knee as type, in a case of hydarthrosis, the serous effusion may come on almost without pain; perhaps slowly, sometimes very quickly. The patient finds that he has lost confidence in his knee; it seems unsteady, and perhaps hurts him upon attempting to rise or on going upstairs. With this he is apt to have other unimportant pains in different parts of the body. He now examines the knee to find what is wrong, and is astonished to find the joint distended in an oval way, manifestly full of fluid.

Sometimes the onset of the joint inflammation is attended by considerable local pain, but there is no fever, no redness of the skin, no sweating, no excess of urates in the urine; and after the effusion has taken place the pain moderates or disappears entirely, except when the joint is moved or handled. The urethral discharge meantime keeps on unabated. Other joints may now become implicated, but the knee continues swollen instead of getting well, as in ordinary rheumatism. Indeed, the joint first attacked is generally the last to get well, thus earning for the malady the title, mono-articular, even where more than one joint is affected.

The course of this hydarthrosis is often exceedingly slow. Acute suppuration, although noted, has been rare. It has been known to prolong itself for years, and to degenerate in strumous individuals into white swelling, and it may go on to an ultimate disorganization of the joint, with final anchylosis.

The next form of gonorrhœal rheumatism to be considered is the poly-articular variety. This form is nearly as common as the hydarthrosis, and sometimes coincides with it. The affection closely resembles rheumatic gout, but it is desperately chronic in its course. A patient under my care has had three attacks of this form of gonorrhœal rheumatism, each one of which lasted him in the neighborhood of eighteen months.

The acuteness of the symptoms, in this form of the malady, varies greatly. They may be very mild, simply confined to a little stiffness of the joints upon moving, especially in the morning, or they may go on to

the extent of occasioning very considerable spontaneous pain in the affected joints, with redness of the skin at first, and many of the features possessed by joints becoming inflamed in the course of ordinary rheumatic gout. After some days, however, these acute symptoms become subacute, and the malady assumes its customary march, which is one of tiresome chronicity. In this form of the disease it is customary for several, perhaps for many joints, to become involved consecutively; but the trouble continues in the old joints, and does not leave them when new joints suffer, as is so apt to be the case in common rheumatism. One or more of the joints implicated in this form of rheumatism may become the seat of secondary hydarthrosis, a phenomenon quite uncommon in ordinary rheumatism.

The general symptoms are moderate. The fever is absent or not intense, and subsides quickly. The urine continues normal, or if charged with urates is so to a degree much less marked than in ordinary rheumatism. The sweating, also, is moderate, or absent altogether.

In this form of gonorrhœal rheumatism, especially when the smaller articulations (fingers and toes) are the seat of the malady, the periosteal and fibrous tissues around the joints seem to share in the inflammation, and the joints become swollen in a fusiform manner, recalling certain forms of rheumatic gout. These deposits are very slow to disappear. Occasionally they leave distortion of the joint behind them, and, very rarely, anchylosis.

Finally, in connection with this form of rheumatism, relapsing attacks of erythema nodosum upon the lower extremities have been noted, rheumatic laryngitis (Libermann) and occasionally pleuritic, endocardial, and pericardial troubles.

Another form assumed by gonorrhœal rheumatism is that of pain and inflammation in the muscles, tendons, sheaths of tendons, bursæ, and nerves. Such pains are sometimes very acute, they are aggravated by motion and by handling the parts; they are generally worse at night. They are chronic in their course and apt to relapse. A number of weeks, or even months, sometimes pass before they are brought under control.

The bursæ most often implicated are the bursa under the tendo-Achillis (the inflammation of which was at one time thought to be pathognomonic of this form of rheumatism), the bursa under the inferior tuberosity of the os calcis, in front of the patella and behind the olecranon. Other bursæ also occasionally suffer, and sometimes in a very acute way. The acute symptoms, however, are rarely of long duration.

The bursæ are very rarely attacked alone. Their inflammation coincides most often with the poly-articular form of gonorrhœal rheumatism, and furnishes excellent corroborative evidence as to the nature of the disorder.

Fournier has called especial attention to a congestive and hyperplastic condition of the periosteum, brought about by gonorrhœal rheumatism, and found more especially upon those portions of bone which are most prominent, nearest the surface of the body—most exposed, in a word. Circumscribed pain, aggravated by pressure, is the symptom which calls attention to these lesions, and examination reveals generally a localized swelling not larger than an inch in diameter, often much smaller. The tissues in such an area are thickened, the skin over them sometimes reddened. Fournier believes that the pain sometimes ascribed to the affection of a bursa or tendon may be due to a deep-seated periostitis—*the pain* under the heel, for example.

These periosteal troubles are passing in their nature. In a few days the pain disappears, and resolution takes place. Occasionally the local troubles persist and terminate in a local hard swelling attached to the bone, which takes several months to subside.

The neuralgias most common in connection with gonorrhœal rheumatism attack the lumbar region, or involve the anterior crural or the sciatic nerves. They are neither very common, nor very important.

Treatment.—Gonorrhœal rheumatism does not yield readily to any treatment. Its peculiarly persistent chronicity is one of the features of the disease. As much rest as possible should be granted to the affected joints, but rest in bed is out of the question for a malady which may (though exceptionally) last eighteen months.

The hydrarthrosis should be subjected first to the action of multiple vesication. A large number of small blisters, one or two inches in diameter, may be consecutively applied, until the whole surface of the joint, excepting the folds and such portions as are put on the stretch during the movements of the joint, has been covered. After this the surface may be kept constantly painted with the strong tincture of iodine and accurate pressure methodically applied, such, for instance, as is obtained for the knee by an elastic knee-cap.

Alkaline medicines are of little or no value in any of the forms of gonorrhœal rheumatism, and the same may be said of colchicum, quinine, colocynth, and other remedies used to overcome ordinary rheumatism. There is rarely enough pain to call for opium. Bromide of potassium, in large doses, is often sufficient to meet the indication furnished by pain, except in connection with some of the acute outbursts of the affection, an acute bursitis, for instance. In such cases a blister will often serve as the swiftest anodyne, and has the advantage not only of controlling the pain, but also of curtailing the malady.

One remedy, useful in rheumatism, certainly retains some of its power in the gonorrhœal variety. I refer to salicylate of soda. Doubtless salicylic acid or other salicylates would do as well. I have used the salicylate of soda in several cases, pushing it rapidly to the point of producing either some disturbance of the head, the stomach, or the intestines, and then reducing the dose; and I have every reason to be satisfied with the result, which is sometimes unexpectedly prompt. It may fail absolutely.

The iodide of potassium in moderate, continued doses (gr. v.—x. three times a day) seems also to possess virtue in combating some of the more chronic forms of the malady.

The chronic stages of trouble in the joints, tendons, and bursæ are best treated by frictions, massage, and all kinds of manipulation, gentle or severe, according to the intensity of the symptoms, and the effect produced. Sulphur baths, alkaline baths, Turkish, Russian, turpentine, and electric baths, are also quite serviceable in these conditions. Electricity with massage often gives great comfort. The continued current is very useful, although some patients declare that they derive most benefit from the induced current.

Change of air and sea-bathing will sometimes effect a cure, in a case which drags along hopelessly under all methods.

GONORRHŒAL IRITIS.

During the course of poly-articular gonorrhœal rheumatism, or alternating with it during different attacks of urethral inflammation, several

maladies of the eye have been noted, such as are seen, also, sometimes in connection with ordinary chronic rheumatism and rheumatic gout. The iris, the conjunctiva, and the membrane of Descemet are the tissues most apt to be involved. These ocular affections are in no way due to contagion. The contact of pus with the conjunctiva produces a very different malady, one which threatens the existence of the eye, and is very apt to lead to suppuration of the globe. On the other hand, the rheumatic maladies of the eye, dependent upon gonorrhœa as a cause, are never due to contagion, and invariably get well without compromising either the structure of the eye or its function.

These maladies, therefore, are not clinically of much importance, and their main interest lies in the fact that once a patient suffers from them during the course of a gonorrhœa, he is almost certain, at the time of his next urethral inflammation, to have his eyes involved in a similar manner.

Symptoms.—In this malady the cornea generally becomes somewhat (perhaps considerably) clouded, particularly in its lower portions. The cornea is apt to grow prominent from over-distention with fluid (aquo-capsulitis). The sight becomes imperfect, objects growing misty. The iris, the main seat of the malady, does not show much change in color. The pupil may be slightly dilated and irregular, or normal. The movements of the iris are abolished or quite sluggish under the action of light. Adhesions are not common, although plastic exudations do occur. There is generally mild lachrymation, slight photophobia, and uneasiness rather than pain in and about the eye.

The conjunctiva may be alone the seat of an injection (Fournier) in the course of gonorrhœal rheumatism marked by slight redness and swelling of the conjunctiva, some uneasiness or perhaps no pain at all, and a scanty muco-purulent discharge.

The course of this iritis is generally rapid, sometimes quite slow. Untreated it may result in adhesions of the iris, but the milder cases get well spontaneously. Both eyes are apt to suffer, more often consecutively than simultaneously. The diagnosis of the affection is easy. It could hardly be possible to confound it with purulent conjunctivitis due to contact with gonorrhœal pus on account of the intensity of the symptoms in the latter malady.

Treatment.—If the conjunctiva alone is involved, it is sufficient to wash the eye with warm water containing a little salt, or to use a solution of one grain of sulphate of zinc in the ounce of water, and to shield the eye from light. The patient may go about as usual.

A certain amount of aquo-capsulitis does not call for any excessive precautions. A little atropine may be used in addition to the means already indicated, and the fluid will generally disappear after a few days. If the tension becomes very great, the anterior chamber may be tapped, and the fluid allowed to escape.

When the iris is lightly involved instillations of a solution of atropine (gr. ij. to the ℥ i.) should be made daily into the eye, or oftener if necessary, to keep the pupil dilated, and the eye should be carefully shielded from light. In more severe cases inunctions of belladonna ointment and of oleate of morphia about the eye are called for; tonics, good diet, change of air in chronic cases, and a leech to the temple or a blister behind the ear. It is questionable whether the internal use of mercury is of any especial value in this malady. Chronic cases demand quinine, tonics, time, and what is perhaps best of all, change of air.

CONTAGIOUS PURULENT OPHTHALMIA.

This serious malady needs the force of no new illustration to testity to its malignity, yet I may be pardoned for reporting a single case to enforce upon the physician the necessity of instructing the patient at all times in relation to the virulence of his malady, and the danger he runs of losing his sight, should he inadvertently inoculate his conjunctiva with the secretions from his own urethra.

A young man passing through New York, consulted me for a commencing gonorrhœa, his first attack. I saw him but once and gave him proper instructions. Possibly, I was not forcible enough in my warnings about the eyes, but whatever the cause, it turned out that upon the evening before leaving town for the country the patient experienced a feeling as if there were sand in the eye. Arrived at a country town one eye was quite inflamed, and the physician of the place was summoned. This gentleman declared the attack to be due to cold, and treated it with mild eye washes, etc. The other eye now took fire. Pain was intense, the discharge profuse. The young man was ashamed to acknowledge that he had a gonorrhœa, and he was lulled into security by the assurances of his physician that all would go well. One of the members of the family, however, wrote to me to ask for what the boy had consulted me, and to inquire whether any bad result was to be dreaded from the fierce inflammation of both eyes already several days old.

My instant reply was that sight was threatened, and that the best oculist within reach must be summoned. This was done, but almost too late, for after a long and painful illness this patient finally only recovered with the perception of the difference between light and darkness and the power to distinguish large moving objects in a full light. His distorted iris was attached on either side to a misshapen scar constituting the cornea. The beauty had gone out of his eyes and almost their use forever.

Gonorrhœa, perhaps more than all maladies, throws a responsibility upon the surgeon which he cannot escape. It is his duty, as a part of the treatment of the disease, to dwell again and again upon the danger the patient runs of contaminating himself with his own secretions. If the patient has been thoroughly impressed upon this point, and then by accident infects himself and through shame fails to put any new medical attendant upon the right track as to the cause of his malady, he has himself to blame for the result and cannot accuse his first physician.

A patient with gonorrhœa should wash his hands each time after handling his penis. All wraps and articles contaminated with the pus should be destroyed. After washing his hands, the water should be instantly thrown away, and the towel used to dry his hands upon should not be used for any other purpose. In the same manner, when the surgeon touches a patient's eyes which are suffering from this virulent inflammation, he must use all possible precautions not to carry the contagion further, and all dressings, which have been once defiled by contact with the poisoned pus flowing from the eyes, must be immediately destroyed.

Fortunately, gonorrhœal ophthalmia is rare, doubtless due to the fact that the danger to the eye of contact with gonorrhœal pus is quite generally understood among the people. The disease is not often double at the start, but it is very apt to become double during its course, unless great care be taken to shield the well eye while the other is being treated.

Symptoms.—Within a few hours after contagion the eye feels dry and itching, as if sand were beneath the lids. The eye waters a little from

the start, and the conjunctiva promptly becomes red, the lids slightly œdematous. The preaural lymphatic gland swells and becomes painful to the touch.

The pain, swelling, and discharge increase with wonderful rapidity. The upper lid swells so much and so rapidly that it soon completely covers the lower lid, and lies out prominently upon the cheek, red and œdematous.

The conjunctiva beneath is the seat of enormous swelling. It becomes highly vascular, looking raw, sometimes livid in color, raised into a thick border around the cornea (chemosis), which lies at the bottom of the cup formed by the swollen conjunctiva, generally drowned in pus. A diphtheritic exudation into the substance of the conjunctiva is quite frequent in these cases. The membrane can be seen but cannot be lifted from the conjunctiva, since the deposit is interstitial and not superficial.

The pus, green and thick, flows out abundantly upon the cheek, thinned from time to time by a gush of tears, sometimes tinged with blood. The lids partly stick together with the thick incrustations of matter which incessantly flow away. The epithelium upon the cheek becomes sodden, perhaps soaked away by constant contact with the acrid secretions.

The cornea soon gets into difficulty from strangulation by the chemosis. It becomes at first troubled, then softened at the edge at points underlying the swollen conjunctiva, and so rapidly do the morbid changes occur, that within twenty-four hours from the commencement of the affection the cornea may have ulcerated to the point of perforation. Abscess may form in the cornea and discharge externally, followed shortly by a giving way in the posterior wall of the abscess, which allows the fluid to escape from the anterior chamber and the iris to protrude at the opening. Again, the whole cornea may ulcerate peripherally and drop out like a watch-glass, and this may be followed by an escape of the crystalline lens and suppuration, with destruction of the entire contents of the globe.

Meantime, pain is often most intense and photophobia extreme. The pain is felt not only in the eye but all around it. There may be little or no fever (unless the globe suppurates), but profound depression of spirits is the rule. A sense of some impending catastrophe seems to overwhelm the sufferer.

Treatment.—When one eye is found to be the seat of contagious purulent ophthalmia, it becomes the physician's duty immediately to protect the other eye. This cannot be done in any better way than by lint (scraped), a piece of bandage, and some collodion. A thin piece of gauzy material, cut round, is first placed over the lid, then enough scraped lint is placed upon it to make a cushion and allow a little pressure to be made by the final seal, which is composed of several superposed layers of coarse cotton cloth, cut round and soaked in collodion. These last layers become attached by the collodion to the integument of the upper lid, the nose, and the cheek, and absolutely shut out the eye from the rest of the world. This bandage may be removed, after twenty-four hours, in order to be certain that the conjunctiva had not been already contaminated before it was applied. If at such inspection the conjunctiva is found sound, the dressing may be reapplied with the absolute certainty that whatever happens to the inflamed eye, the other will certainly be preserved sound for the patient's future use.

The curative treatment of purulent contagious conjunctivitis rests *upon cleanliness*, relief of strangulation, and arrest of suppuration.

Cleanliness must be maintained through the whole course of the affection. Poulticing is out of the question, since it retains the secretions. Frequent washings with cool water are to be practised, and the edges of the lids left always smeared with vaseline. This prevents their sticking together, and the vaseline itself does not become rancid. The washings should be done with a large camel's-hair pencil, or by squeezing water from a soft rag, not with a syringe, for fear of the sputtering which might scatter some of the infectious pus into the eyes of the nurse while performing the dressing. Anything that touches any pus from the eye must be thrown away at once or immediately disinfected in a solution of permanganate of potash, or other equally good disinfectant. These washings may be repeated, with advantage, hourly, or at such intervals as may be called for by the accumulation of pus.

Next to cleanliness, or perhaps before it, comes the necessity of keeping down pus formation. This is to be effected by local applications, first of cold, second of caustics. Thin compresses, soaked in iced water, and constantly changed, should be applied to the eye. A night nurse, as well as a day nurse, is called for to perform this arduous task. Every few minutes these compresses must be changed, or they heat up and become poultices—agents of mischief. The colder the eye is kept, the better, and the means which can effect this most continuously should be employed. Small quantities of pounded ice in a condome have been suggested (Grand), and might serve well in some cases, but after the vitality of the cornea is threatened and ulceration has commenced, it is well to be prudent in the use of ice, or to suspend it altogether.

Among the local applications used with the view of keeping down pus formation, the nitrate of silver in solution holds the first rank. It is of value when the pus begins to be freely formed, and the strength of solution employed, as well as the frequency of the applications, is decided by the violence of the flow of pus and by the effect of the applications upon it. It is best to use the nitrate of silver in solution, on account of the difficulty of touching all parts of the inflamed conjunctiva with the solid stick. It is well to employ two solutions: one quite mild, from gr. iij. to gr. vi. to the ℥ i. of water, to be applied every two or three hours; and another, much stronger, from gr. x. up to ʒ i. to the ℥ i., to apply at intervals when the secretion of pus becomes too considerable to be held at all in check by the milder solution. The strength of the caustic solution of course must be regulated by the effect upon the pus-forming process. If a reasonably mild solution will hold it in check, so much the better; if not, recourse may be had at each application, after an interval of eight to twelve hours, or longer, if the solution is quite strong, to a solution of greater strength, until the desired effect has been attained, after which the intervals between the applications may be lengthened, or their strength diminished.

In making applications of the nitrate of silver to the conjunctiva, the lids should be everted as much as possible, and the application made in the main upon the palpebral conjunctiva; that upon the globe is of less importance, and every effort should be made to avoid getting any of the solution upon the cornea already devitalized by the strangulation of the vessels supplying its nourishment, and especially since it may permanently discolor the cornea. The conjunctival culs-de-sac stand in especial need of the applications, which can hardly be made too thoroughly at these points. After each application of the nitrate of silver the eye should be freely brushed over with a strong solution of common salt in water to

neutralize all excess of the nitrate of silver which may remain in the eye. Cold compresses upon the eye after each application of caustic will help to allay the pain.

When the conjunctiva and lids swell much, the eye suffers from tension in two ways: by the tightness of the tarsal border which irritates the eye and prevents a free outflow of the discharges, and by the chemosis of the conjunctiva which strangulates the cornea. Both of these strangulations may, and should be relieved, the first but freely cutting the outer canthus, enlarging the palpebral slit, the second by deep and thorough scarification of the chemosed conjunctiva, or even when the chemosis is more solid, by snipping away portions of the raised rim about the cornea with scissors curved on the flat. A number of strips of conjunctiva, running in rays away from the cornea, may thus be snipped away, with the result often of saving the cornea, and without leading to any ultimate damage when the eye gets well. Both scarifications and partial excision of the cornea should be practised after, and not before, a cauterization.

The cornea requires especial attention. The cup at the bottom of which it lies should be washed out, and the edge of the cornea all around under the overhanging chemosed conjunctiva should be frequently inspected, to detect the commencement of abscess, or of the ulcerative process. As soon as rupture of the anterior chamber seems imminent, the escape of the fluid should be anticipated by paracentesis of the cornea, and the incision should be kept fistulous, if possible, by the use of a fine probe, until the cornea is out of danger.

A solution of atropine should be dropped into the eye several times a day from the first. It tends to diminish intra-ocular tension, to reduce pain, and to keep the iris out of harm's way, either from adhesion or from prolapsing into any fortuitous opening in the cornea, due to the perforation of an ulcer. Should such prolapses occur, any portion which projects may be cut away. Adhesion of the iris to the cornea at the point of prolapse is quite certain to take place, calling perhaps for iridectomy when the patient recovers.

Something may be done toward calming the peri-orbital pains by inunctions upon the brow and temple of belladonna ointment and oleate of morphine.

As the eye begins to recover, it must be shaded from the light and tenderly nursed for a long time. The lotions of nitrate of silver may be gradually reduced in strength, and finally substituted by mild solutions of sulphate of zinc, or alum, or by simple salt in hot water. An eye may come out of the contest much damaged, but yet capable of being nursed up to the point of being of considerable use to its possessor. In bad cases vision is totally destroyed.

The internal treatment should be supporting and tonic throughout, all the energy of the treatment being devoted to the local measures. Mercury, up to the point of producing salivation, has been advised in bad cases where there is a diphtheritic tendency, but the suggestion by no means receives the uniform indorsement of authorities, and is of questionable propriety, certainly so far as regards a majority of the cases seen in cities where the vitality of the individual is not high. The malady itself is unquestionably very debilitating, and tonics and good food are called for more than any other internal remedies. Laxatives are usually required, and a judicious use of anodynes, to insure sleep and control pain.

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